MAR 28 '51
ROOM 108

CHILD DEVELOPMENT

Vol. 22
March, 1951
No. 1

Published Quarterly by

CHILD DEVELOPMENT PUBLICATIONS

OF THE

SOCIETY FOR RESEARCH IN CHILD DEVELOPMENT, INC.

CHILD DEVELOPMENT

Editorial Board

T. W. RICHARDS, *Editor*
Professor of Psychology
Northwestern University

HAROLD E. JONES
Director, Institute of Child Welfare
and Professor of Psychology
University of California

V. O. HURME
Forsyth Dental Infirmary

VOLUME 22

MARCH, 1951 to DECEMBER, 1951

EVANSTON, ILL.

CHILD DEVELOPMENT PUBLICATIONS

SOCIETY FOR RESEARCH IN CHILD DEVELOPMENT, INC.

1951

CHILD DEVELOPMENT

Vol. 22

March, 1951

No. 1

Editorial Board

T. W. RICHARDS, *Editor*
Professor of Psychology
Northwestern University

HAROLD E. JONES
Director, Institute of Child Welfare
and Professor of Psychology
University of California

Published Quarterly by

CHILD DEVELOPMENT PUBLICATIONS
(of The Society for Research in Child Development, Inc.)
Fayerweather Hall, East
Northwestern University
Evanston, Illinois

Made in United States of America

Printed by
THE ANTIOCH PRESS
Yellow Springs, Ohio

BODY FORM IN CHILDHOOD: RATIOS QUANTITATIVELY DESCRIBING FOUR SLENDER-TO-STOCKY CONTINUA ON BOYS FOUR TO EIGHT YEARS OF AGE

HOWARD V. MEREDITH and STANLEY S. CULP
School of Health and Physical Education, University of Oregon

Most recent studies of human body form[1] have been made on college students (4, 5, 10, 20) or older adults (8): there is need for ongoing research with children. Further, a large percentage of the available studies of human form have used inspectional judgments as their primary data[2] (22, 12, 21): there is need for investigations in which the primary data are metrical.[3]

In the opinion of the writers, anthropometric ratios provide a more objective approach to body build than that afforded by observational ratings. This is not an original position. Bowles, for instance, has written: "Visual appraisal of body build is at best a poor substitute for measurements of body heights and breadths" (3, p. 92).

It is recognized, of course, that objectivity is no more than a methodologic facet of the ultimate desideratum. Descriptions of body form or build, like descriptions of all other biologic variables, must be weighed for their validity. This weighing will necessitate large patterns of research. The present study is one small piece of the projected mosaic—a mosaic that will show whether characterizations of body form have higher validity when the primary data are morphologic ratios or when they are inspectional ratings.

THE PROBLEM

In this paper four ratios are studied, all of which describe continua of the slender-to-stocky variety. One of the ratios yields a measure of the amount of over-all rotundity, while the other three afford measures of the

[1] The terms body form, morphologic type, body build, physique, body shape, somatotype, and body proportions are used synonymously by different writers.

[2] The word "primary" is significant here: studies employing inspectional judgments as their basic or principal data not infrequently make secondary or supplementary use of metrical data (12, 20).

[3] There is no intention of implying that the present investigation is the first to use a metrical approach to the study of body form in childhood. Illustrative of earlier work are the studies of head form by Bayley (2), face form by Goldstein (9), chest form by Meredith and Knott (16), trunk form by Davenport (7), and gross body form by Pryor (18) and McCloy (15).

degree of slenderness-to-stockiness of the upper extremities, lower extremities, and body stem respectively.[4] Series of values for each ratio, obtained at successive annual ages from four years to eight years, are used to attain the following objectives:

1. To determine the central tendency trends for each index with age. Answers were sought to questions such as, Does the upper extremity of the typical boy, over the age period from four to eight years, show an increase, no change, or a decrease in stockiness? If it decreases in stockiness (i.e., becomes more slender), does it slenderize more between four and six years than between six and eight years, or vice versa? Is the trend similar for all four ratios?

2. To compute the limiting values of a fivefold subdivision of the frequency distribution for each index at every age. Here the aim was that of utilizing the obtained figures on a given ratio at five boyhood ages in order to establish normative variability categories appropriately designated—*Stocky, Moderately stocky, Average, Moderately slender, and Slender.*

3. To analyze the interrelations of the four indices. Illustrative of the specific problems projected for solution were the following, How frequently do boys who have stocky body stems have average or slender upper limbs? Is the association between the upper limb ratio and the lower limb ratio sufficiently high that either one is adequate to represent both pairs of appendages?

The Ratios

In order to obtain biologically sound age trends from ratios, the same form of measurement data must be used in the numerator and denominator of the ratio. That is, an area must be divided by an area, a volume by a volume, and a linear measure by a linear measure. This point can be illustrated with some findings from an early study (1) employing the ratio of weight in kilograms to stature in centimeters. The ratio means reported for boys at selected ages in early childhood are as follows:

	Age in years				
	1	2	3	4	5
Weight/Stature index	.127	.138	.148	.155	.160

The index rises, appearing to indicate that the child's body increases in stockiness with age. However, a measurement of mass was divided by a linear measurement. Adjustment of the measures to approximate the same form can be made by taking either the cube root of the weight or the cube

[4] Another variety of body form continua pertains to regional and segmental predominance. Examples are shoulder width in relation to hip width (7, 11), chest girth in relation to abdomen girth (19), limb length relative to stem length (17), and upper limb length relative to lower limb length (6).

of the stature (14). When the data of the study are reworked using the cube root of weight the results are:

	Age in years				
	1	2	3	4	5
Cube-Root-of-Weight/Stature index	.029	.027	.026	.025	.024

The index now falls, reflecting the biologic truth that there is a decrease in stockiness with age. This accords with common observation of the transformation of the "dumpy" toddler into the more "lanky" schoolboy.

The four indices used are as follows:

$$\text{Upper limb index} = \frac{\text{Arm girth}}{\text{Upper limb length}} \times 100$$

$$\text{Lower limb index} = \frac{\text{Leg girth}}{\text{Lower limb length}} \times 100$$

$$\text{Stem index} = \frac{\text{Chest girth}}{\text{Stem length}} \times 100$$

$$\text{Over-all index} = \frac{\text{Cube root of weight}}{\text{Stature}} \times 100$$

The form of the over-all index has been explained. The other three indices require no correctional adjustment. This follows since body circumferences are basically linear measurements.[5]

Subjects and Basic Measurements

Two samples of male subjects were utilized, one drawn in Iowa City, Iowa, and the other in Eugene, Oregon. Anthropometric data were collected on the former over the years 1937 through 1949[6] and on the latter

[5] Recall that a constant relation exists between the circumference of a circle and its diameter (diameter = circumference/3.1416). To subject the numerator (or denominator) of a ratio to division (or multiplication) *by a constant* does not alter the form of its age trend.

[6] While the first author was a member of the staff of the Iowa Child Welfare Research Station, University of Iowa.

between January and May, 1950.[7] Both samples were composed exclusively of American-born White boys of northwest European ancestry.

The Iowa City sample consisted of 180 boys residing in or near Iowa City and attending the University of Iowa experimental preschool laboratory and/or elementary school. From the standpoint of socioeconomic status, these subjects represented an upward selection. Information on occupation of fathers showed between 75 and 80 per cent to be professional men (mainly members of the University faculty) and the remainder business proprietors or managers.

The Eugene sample comprised 109 boys residing in or near Eugene and attending the 15 elementary schools of Public School District No. 4, Lane County, Oregon. Here information on occupation of fathers indicated that between 20 and 25 per cent fell in the professional and managerial groups, while the preponderant remainder were skilled to unskilled employees (mainly engaged in lumber manufacturing or railroad maintenance).

Most of the Iowa City boys were examined at more than one age, many annually over the period from age four years to age eight years. Always the anthropometric examinations were made within three days of a subject's birthday. For the Eugene sample each boy was examined once only, and at the time of examination the boys ranged in age from six years ten months to seven years two months.

An exceptionally rigorous procedure was followed in collecting the data on both samples. At every examination, each measurement was taken by two anthropometrists. In instances where their results failed to show close agreement (i.e., agreement within 0.1 kg. for weight, 0.1 cm. for leg girth, 0.2 cm. for stature and arm girth, and 0.4 cm. for the other dimensions), additional measurements were made. This degree of research rigor was initiated in 1937 and maintained throughout the thirteen years of data collection in order that the obtained measurements would not differ appreciably from true morphologic values and, therefore, would constitute highly valid basic data for the computation of ratios.

The anthropometric techniques employed in obtaining the measurements were as follows:

Weight. — Weight, in common with all of the other measurements, was determined nude on the Iowa City sample and in shorts on the Eugene sample. Each boy stood in the center of the platform on beam-type scales. At the time of reading a weight, care was taken to observe that the boy's hands were not in contact with the head portion of the scales, the wall, or any other object. The scales were checked frequently and, whenever necessary, adjusted.

Stature. — Erect body length was measured using an upright board (to

[7] Acknowledgment is made to the Graduate School, University of Oregon, for a special research grant.

which was attached a Baldwin millimeter scale) and a wooden square. The boy stood with heels almost together, and with heels, buttocks, upper part of back, and rear of head in contact with the board. As the square was brought down upon the vertex,[8] care was taken to see that each boy kept the plantar surface of his heels in firm contact with the floor.

Chest girth. — The instrument used in taking all of the girth measurements was a steel millimeter tape. Chest girth was determined as the circumference of the thorax at the level of the xiphisternal junction. In preparation for measurement each boy stood in a natural manner with head erect and with the upper extremities relaxed and held slightly away from the sides of the body. The tape was passed around the trunk in a horizontal plane at the xiphisternal level and brought into light contact with the skin. The reading made was the median girth during normal respiration.

Stem length. — In taking this measurement, a horizontal bench 30 cm. in height was placed at the base of the upright board used in obtaining stature. Each boy sat on this bench with his ankles crossed, his knees spread apart, and the posterior aspect of his trunk in contact with the board at the sacral and upper thoracic regions. Stem length was determined as the distance from the surface of the bench to the vertex. It follows that stem length is synonymous with sitting height.

Arm girth. — Arm and leg girths were taken on the left side. For measurement of arm girth subjects stood in a natural manner with the upper extremities hanging in a relaxed condition at the sides of the body and with the left extremity slightly abducted so that the arm was not in contact with the lateral wall of the thorax. The tape was passed around the arm about halfway between the shoulder and elbow. This area was explored to find the greatest girth at right angles to the long axis of the limb and inferior to any surface indication of the deltoid muscle. The reading was taken with the tape in sufficiently light contact with the skin to avoid compression of the tissues.

Upper limb length. — This measurement was taken on the left extremity using wooden sliding calipers. After extending the extremity at the side of the body and rotating the hand so that its palmar surface faced the thigh, the distance was found from the lateral border of the acromion process to the most distal point of the middle finger. The instrument was applied from the rear, care being taken to keep its shaft parallel with the long axis of the limb and to guard against the tendency of many boys to tilt the shoulder axis as the limb was extended.

Leg girth. — Each boy stood with his feet about six inches apart and his weight distributed equally through both lower limbs. Maximum circum-

[8] The highest point of the head when the head is oriented with the tragion-orbitale plane at right angles to the long axis of the body.

ference of the left leg was determined by passing the tape around the leg in the region of the calf and exploring to find the largest reading at right angles to its long axis. As for arm girth, the tape was read at "light contact" tension.

Lower limb length. — This measurement was derived by subtracting a boy's stem length from his stature. The techniques of direct measurement of lower limb length that anthropometrists have employed to date have not been found as reliable as the indirect method of taking stature minus stem length.

TABLE I

MEANS* FOR FOUR BODY FORM RATIOS ON NORTH AMERICAN WHITE BOYS OF NORTHWEST EUROPEAN ANCESTRY

Age (yrs.)	Iowa City		Eugene		Iowa City		Eugene	
	N	*Mean*	*N*	*Mean*	*N*	*Mean*	*N*	*Mean*
	UPPER LIMB INDEX				STEM INDEX			
4	60	39.4	...	....	108	88.7	...	....
5	105	37.6	...	....	168	88.2	...	....
6	92	36.3	...	....	143	87.4	...	....
7	85	35.5	109	35.3	124	86.9	109	86.4
8	76	34.4	...	....	97	86.4	...	....
	LOWER LIMB INDEX				OVER-ALL INDEX			
4	109	50.1	...	....	110	2.49	...	....
5	168	47.8	...	....	167	2.44	...	....
6	142	46.1	...	....	145	2.39	...	....
7	125	44.8	109	44.9	127	2.35	109	2.35
8	97	43.6	...	....	95	2.32	...	....

* Both means and medians were computed. Identical results were obtained at ages four and five years, while at seven and eight years the medians were slightly lower than the means. Specifically, the medians at age eight were 33.9 for the upper limb index, 85.9 for the stem index, 43.0 for the lower limb index, and 2.31 for the over-all index.

CENTRAL TENDENCY FINDINGS

The basic measurements were (a) grouped with reference to the sample and year of age they represented and (b) utilized to derive the four ratios previously defined. Table I presents the mean from each resultant series of values. It will be seen that,

1. There is a gradual decrease with age in all four of the ratios. Arm girth is 39.4 per cent of upper limb length at age four years, and 34.4 per cent of upper limb length at age eight years. Corresponding declines are 88.7 per cent to 86.4 per cent for the stem index, 50.1 per cent to 43.6 per

cent for the lower limb index, and 2.49 per cent to 2.32 per cent for the over-all index.

2. For each ratio, the decline is somewhat more marked between four and six years than between six and eight years. The mean for the lower limb index is 4.0 lower at age six years than at age four years, and 2.5 lower at age eight years than at age six years. Parallel findings are 3.1 and 1.9 for the upper limb index, 1.3 and 1.0 for the stem index, and 0.10 and 0.07 for the over-all index.

3. With one exception, the means for the Eugene sample at age seven years are practically equivalent to those for the Iowa City sample representing the same age. The stem index means are sufficiently different to warrant separate consideration: note that the body stem of the Eugene boys age seven years is as slender as that of the Iowa City boys age eight years.

Summarily, the trends obtained for central tendency may all be characterized as falling curves convex to the abscissa. They support the generalization: Insofar as body form is represented by the four indices under investigation, during the period from four to eight years of age the typical boy becomes less stocky (i.e., more slender) at a diminishing rate.

Variability Findings

In studying the variability of each ratio, the aim was to construct frames of reference that would, at once, display the dispersion within the age groups sampled and have functional usefulness for describing the body-form status and/or progress of like-age boys. To elaborate upon the latter aspect of this aim, the end sought was a practical procedure for (a) obtaining body-form profiles on individual boys at the five ages under study[9] and (b) following the stability or extent of shift in an individual's profile from age to age within this period.[10]

Five variability categories were decided upon, and the frequency distribution representing each ratio and year of age (Iowa City data only) was subjected to fivefold subdivision. The categories were designated—Stocky,

[9] As suggested earlier, the four ratios of this study supply but part of what could be considered a reasonably comprehensive profile for body form. To these should be added ratios portraying head width in relation to head length, face width in relation to face height, shoulder width in relation to hip width, chest girth in relation to abdomen girth, stem length in relation to length of limbs, and possibly others.

[10] The diversity of opinion and paucity of data on the persistence or modifiability of body form during the school years points to the need for variability tables that can serve in investigation of the frequency with which (and the degree to which) individuals maintain or change their positions in the peer group: a major physical growth problem is that of discovering the extent to which body form is "a permanent, fixed characteristic of the individual" and the extent to which it is factually sound to inform "boys and girls who go through a stage of being extra plump . . . that this will pass, and that a few years hence they may be among the more slender of their age group" (23, p. 109).

Moderately stocky, Average, Moderately slender, and Slender. In deriving boundary values for these categories, the first step was that of computing the 10th, 30th, 70th, and 90th percentiles of each frequency distribution. The 30th and 70th percentiles were used as the boundary values of the "Average" category; the 10th percentiles as the lower limits of the category captioned "Moderately slender"; and the 90th percentiles as the upper limits of that captioned "Moderately stocky." This means, of course, that the slender category arbitrarily was defined to include the lowest 10 per cent

TABLE II

VARIABILITY NORMS FOR FOUR BODY FORM RATIOS ON NORTH AMERICAN WHITE BOYS OF NORTHWEST EUROPEAN ANCESTRY

	Slender	*Moderately Slender*	*Average*	*Moderately Stocky*	*Stocky*
		AGE FOUR YEARS			
Upper limb index	Below 36.0	36.0—37.7	37.8—40.5	40.6—42.3	Above 42.3
Stem index	Below 84.6	84.6—86.9	87.0—90.3	90.4—93.0	Above 93.0
Lower limb index	Below 46.6	46.6—48.5	48.6—51.6	51.7—53.9	Above 53.9
Over-all index	Below 2.41	2.41—2.45	2.46—2.52	2.53—2.56	Above 2.56
		AGE FIVE YEARS			
Upper limb index	Below 34.6	34.6—36.1	36.2—38.9	39.0—40.9	Above 40.9
Stem index	Below 83.7	83.7—86.1	86.2—89.6	89.7—92.6	Above 92.6
Lower limb index	Below 44.1	44.1—46.2	46.3—49.4	49.5—52.9	Above 52.9
Over-all index	Below 2.36	2.36—2.39	2.40—2.47	2.48—2.52	Above 2.52
		AGE SIX YEARS			
Upper limb index	Below 33.3	33.3—34.6	34.7—37.6	37.7—39.8	Above 39.8
Stem index	Below 82.7	82.7—85.2	85.3—89.0	89.1—92.1	Above 92.1
Lower limb index	Below 42.2	42.2—44.3	44.4—47.5	47.6—50.4	Above 50.4
Over-all index	Below 2.31	2.31—2.34	2.35—2.43	2.44—2.49	Above 2.49
		AGE SEVEN YEARS			
Upper limb index	Below 32.1	32.1—33.4	33.5—36.3	36.4—38.9	Above 38.9
Stem index	Below 81.7	81.7—84.5	84.6—88.5	88.6—91.8	Above 91.8
Lower limb index	Below 40.6	40.6—42.7	42.8—45.9	46.0—49.1	Above 49.1
Over-all index	Below 2.26	2.26—2.30	2.31—2.39	2.40—2.46	Above 2.46
		AGE EIGHT YEARS			
Upper limb index	Below 31.2	31.2—32.3	32.4—35.1	35.2—38.1	Above 38.1
Stem index	Below 80.7	80.7—83.7	83.8—88.1	88.2—91.5	Above 91.5
Lower limb index	Below 39.5	39.5—41.5	41.6—44.8	44.9—48.1	Above 48.1
Over-all index	Below 2.22	2.22—2.26	2.27—2.35	2.36—2.43	Above 2.43

TABLE III

INTERCORRELATIONS FOR FOUR BODY FORM RATIOS ON NORTH AMERICAN WHITE BOYS OF NORTHWEST EUROPEAN ANCESTRY

Age (yrs.)	Lower Limb Index with Stem Index		Upper Limb Index with Stem Index		Upper Limb Index with Lower Limb Index	
	r	t*	r	t	r	t
4	.27	2.9	.40	3.3	.71	7.6
5	.28	3.7	.29	3.0	.75	11.5
6	.26	3.2	.42	4.3	.68	8.6
7	.53	6.9	.56	6.2	.69	8.7
8	.44	4.7	.66	7.6	.77	10.2

Age (yrs.)	Lower Limb Index with Over-all Index		Upper Limb Index with Over-all Index		Stem Index with Over-all Index	
	r	t	r	t	r	t
4	.76	12.3	.77	9.1	.65	8.8
5	.63	10.3	.66	8.8	.66	11.1
6	.80	15.4	.76	10.9	.62	9.4
7	.85	18.0	.83	13.5	.77	13.4
8	.86	15.8	.85	13.6	.72	10.0

* For a discussion of the nature and appropriateness of this test of statistical significance see Lindquist (13, pp. 210-211).

of each distribution of ratios, the moderately slender category to include the next 20 per cent, the average category to encompass the middle 40 per cent, the moderately stocky category to encompass the next 20 per cent, and the stocky category to comprise the highest 10 per cent.

The results are given in Table II. To facilitate convenient use of this table in characterizing individuals, the figures for all four ratios at a particular age are placed together.

CORRELATION FINDINGS

What is the relationship between stockiness of the upper extremities and stockiness of the lower extremities? Do boys who have a slender body stem also have a low over-all index? The answers to questions of this order were secured through the medium of the Pearson product-moment method of correlation. Table III presents the coefficients obtained, together with estimates of statistical significance. It is found:

1. All of the correlation coefficients are statistically significant at the one per cent level of confidence. They also all are positive, indicating that to some degree each slender-to-stocky continuum holds a direct relationship to the other three.

2. The correlations are lowest for the lower limb index with the stem index, and only slightly higher for the upper limb index with the stem index. In both instances, the *r*'s are somewhat lower at ages four and five years (.27 to .40) than at ages seven and eight years (.44 to .66).

3. For the upper limb index with the lower limb index, and the stem index with the over-all index, the coefficients are near .70 (.62 to .77). From the standpoint of prediction—in practical terms, of using one of the indices as representative of both—coefficients of this magnitude are not high. Referring specifically to the *r*'s for upper limb index with lower limb index, predictive improvements over "best guesses" fall between 27 per cent (age six) and 36 per cent (age eight).

4. The highest coefficients are those for the upper and lower limb indices with the over-all index. Here, again, the *r*'s at ages four and five years (.63 to .77) are somewhat lower than those at seven and eight (.83 to .86).

Summary

This study makes a metrical approach to the determination of stockiness and slenderness in early childhood. It employs four ratios derived from highly reliable body measurements on boys between four and eight years of age.

Two samples of White boys are used, one representing the professional and managerial socioeconomic groups of Iowa City, Iowa, and the other representing the public school population of Eugene, Oregon. Data on the former are analyzed at each year of age from four to eight, data on the latter at age seven only.

The ratios are studied with reference to central tendency, correlation, and variability. Central tendency values show that over the period from four to eight years of age there is a gradual decrease in the stockiness of the stem, stockiness of the upper and lower limbs, and over-all stockiness of the body. Correlation coefficients manifest a low association between stem stockiness and lower limb stockiness (*r*'s = .26 to .53) and only a moderate association between stockiness of upper and lower limbs (*r*'s = .68 to .77). Variability analysis is directed toward constructing body form tables useful for depicting the age to age constancy or change of an individual's standing in his peer group.

References

1. Baldwin, Bird T. The physical growth of children from birth to maturity. *Univ. Ia. Stud. Child Welf.*, 1 (1) 58-63.

2. Bayley, Nancy. Growth changes in the cephalic index during the first five years of life. *Hum. Biol.*, 1936, 8, 1-18.

3. Bowles, Gordon T. Linguistic and racial aspects of the Munda problem. *Papers, Peabody Mus. Am. Archaeol. & Ethnol.*, 1943, 20, 81-101.

4. Bullen, Adelaide K. and Hardy, Harriet L. Analysis of body build photographs of 175 college women. *Amer. J. phys. Anthrop.*, 1946, 4 n.s., 37-68.

5. Cureton, Thomas Kirk, Jr. Body build as a framework of reference for interpreting physical fitness and athletic performance. *Res. Quart.*, 1941, 12, Supplement, 301-330.

6. Davenport, Charles B. Ontogeny and phylogeny of man's appendages. *Proc. Nat. Acad. Sci.*, 1934, 20, 359-364. (See also *J. Mammal.*, 1935, 16, 291-296.)

7. Davenport, Charles B. The development of trunk width and the trunk width index. *Hum. Biol.*, 1935, 7, 151-195.

8. Draper, George, Dupertuis, C. W. and Caughey, J. L., Jr. *Human constitution in clinical medicine*. New York: Paul B. Hoeber, Inc., 1944.

9. Goldstein, Marcus S. Changes in dimensions and form of the face and head with age. *Amer. J. phys. Anthrop.*, 1936, 22, 37-89.

10. Jorgensen, N. M., and Hatlestad, S. Lucille. The determination and measurement of body build in men and women college students. *Res. Quart.*, 1940, 11, 60-77.

11. Knott, Virginia B., and Meredith, Howard V. Changes in body proportions during infancy and the preschool years: II. Width of hips in relation to shoulder width, chest width, stem length, and leg length. *Child Develpm.*, 1937, 8, 311-327.

12. Kretschmer, E. *Physique and character: An investigation of the nature of constitution and of the theory of temperament.* Trans. from second rev. & enl. ed. by W. J. H. Sprott. New York: Harcourt, Brace, 1926.

13. Lindquist, E. F. *Statistical analysis in educational research*. Boston: Houghton Mifflin Co., 1940.

14. McCLOY, CHARLES H. Methods of classifying body builds, in appraising physical status: The selection of measurements. *Univ. Ia. Stud. Child Welf.*, 1936, 12 (2), 14-18.

15. McCLOY, CHARLES H. Standards of body type, in appraising physical status: Methods and norms. *Univ. Ia. Stud. Child Welf.*, 1938, 15 (2), 13-33.

16. MEREDITH, HOWARD V., and KNOTT, VIRGINIA B. Changes in body proportions during infancy and the preschool years: I. The thoracic index. *Child Develpm.*, 1937, 8, 173-190.

17. MEREDITH, HOWARD V., and KNOTT, VIRGINIA B. Changes in body proportions during infancy and the preschool years: III. The skelic index. *Child develpm.*, 1938, 9, 49-62.

18. PRYOR, HELEN B. Width-weight tables (revised). *Amer. J. Dis. Child.*, 1941, 61, 300-304. (See also *As the child grows.* New York: Silver Burdett Co., 1943.)

19. SCHWARTZ, LOUIS, BRITTEN, ROLLO H., and THOMPSON, LEWIS R. *Studies in physical development and posture.* Washington: U.S. Publ. Health Bull. No. 179, 1928.

20. SHELDON, W. H., with the collaboration of Stevens, S. S., and Tucker, W. B. *The varieties of human physique: An introduction to constitutional psychology.* New York: Harper & Bros., 1940. (In this connection, see Meredith, Howard V. Comments on "The varieties of human physique." *Child Develpm.*, 1940, 11, 301-309.)

21. SHELDON, W. H., with the collaboration of Hartl, Emil M., and McDermott, Eugene. *Varieties of delinquent youth: An introduction to constitutional psychiatry.* New York: Harper & Bros., 1949.

22. TUCKER, WILLIAM B., and LESSA, WILLIAM A. Man: A constitutional investigation. *Quart. Rev. Biol.*, 1940, 15, 265-289, 411-455.

23. UNITED STATES FEDERAL SECURITY AGENCY. *Your child from 6 to 12.* Washington: Children's Bureau Publ. No. 324, 1949.

Manuscript received October 16, 1950.

SEX DIFFERENCES IN THE OCCURRENCE OF MATERIALS IN THE PLAY CONSTRUCTIONS OF PREADOLESCENTS [1]

MARJORIE P. HONZIK[2]
Guidance Study, Institute of Child Welfare
University of California

Sex differences in doll play behavior have been observed among preschool children (6). Yarrow reports that in a nursery school group, boys show "a more active and aggressive approach to the materials, while girls show more passive, inhibited, and socially conforming behavior." Yarrow believes that the sex differences "need to be clearly recognized by the clinician in evaluating children's doll play behavior." Sex-appropriate behavior and attitudes become increasingly important as the child approaches adolescence. For this reason, it appeared to us that normative data on sex differences in the play protocols of preadolescent children aged 11, 12, and 13 years would be of value to the clinician and others interested in child development.

The opportunity to observe the play configurations of preadolescents was offered by the Guidance Study at the Institute of Child Welfare, University of California (3). In this study of the personality development of normal children from birth to maturity, projective techniques were used at certain age levels to supplement information obtained through interviews with the child, his parents, and teachers. The projective protocols obtained include the Rorschach (4), Thematic Apperception Test, and Play Constructions (2). In the present paper, data are presented which show the existence of sex differences with respect to the inclusion of blocks, doll figures, furniture, vehicles, and animals in the play configurations of children aged 11, 12, and 13 years.

---

[1] This is one of two studies of the sex differences in the play protocol data collected by E. H. Erikson at the Institute of Child Welfare. In this paper sex differences in the occurrence of the various play materials in the constructions are summarized. In Erikson's paper sex differences in the spatial arrangements of the blocks and toys are described and evaluated (2).

[2] The author wishes to express her indebtedness to Dr. Jean Walker Macfarlane, who arranged for the inclusion of play protocols in the Guidance Study and gave many helpful suggestions; to Mr. Erikson, who not only collected the data but selected the play materials and developed the methodology of data collection; and to Dr. Harold E. Jones for his helpful comments and criticisms of the manuscript. The figures were drawn by Katherine Eardley.

Funds for clerical and statistical assistance were made available by a grant-in-aid from the U. S. Public Health Service. The study proper was made possible by funds from the Laura Spelman Fund, General Education Board, and the Rockefeller Foundation.

Sample and Procedure

The Guidance Study is a longitudinal investigation of the physical, mental, and personality development of 252 children selected from a larger sample composed of every third birth in Berkeley, California, between January 1, 1928, and July 1, 1929. The socio-economic status of the families of these children is above the average for the United States (3), especially with respect to the education of the parents. This sample, therefore, may be considered representative only of groups living in a western, urban, university community.

At the age of 21 months, the total sample of 252 children was divided into two matched groups on the basis of socio-economic factors (3). One of these subsamples is referred to as the *Guidance Group* because of the program of intensive interviews with the parents and children; the second group with whom there were fewer interviews is referred to as the *Control Group*. The children in both groups were given physical examinations at half-yearly intervals and mental tests at certain age levels. At ages 11, 12, and 13 years, the play procedure was added to the testing program. The method of obtaining the play protocols was developed by E. H. Erikson (2) and has been described as follows:

> Each child was asked to come to a room where he found a selection of toys such as was then available in department stores (blocks, toy furniture, dolls, toy cars, toy animals) laid out on two shelves. There was no attempt to make a careful selection of toys on the basis of size, color, material, etc. As an illustration of the discrepancies, we note that the family dolls were of rubber which permitted their being bent into almost any shape; and they were appropriately dressed. The policeman and aviator, on the other hand, were of unbending metal and were smaller than the family. There were cars, some of them smaller than the policeman, some bigger; but there were no airplanes to go with the aviator.
>
> The toys were laid out in open cardboard boxes, each containing a classification such as (1) people, (2) animals, and (3) cars. These boxes were always placed in the same order. The blocks were on a separate shelf in two piles, one containing a set of large blocks, one a set of small ones. Next to the shelves was a square table with a square background of the same size.
>
> The following instructions were given:
>
> > I am interested in moving pictures. I would like to know what kind of moving pictures children would make if they had the chance to make pictures. Of course, I could not provide you with a real studio and real actors and actresses; you will have to use these toys instead. Choose any of the things you see here and construct on this table an *exciting* scene out of an *imaginary* moving picture.

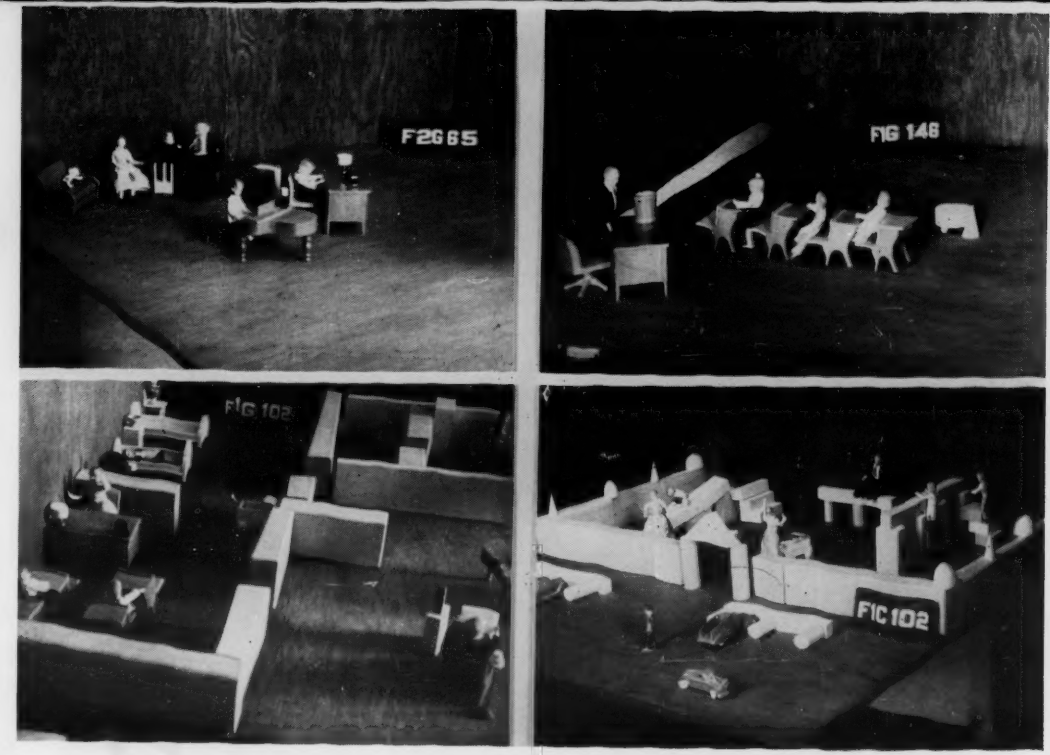


FIGURE 1

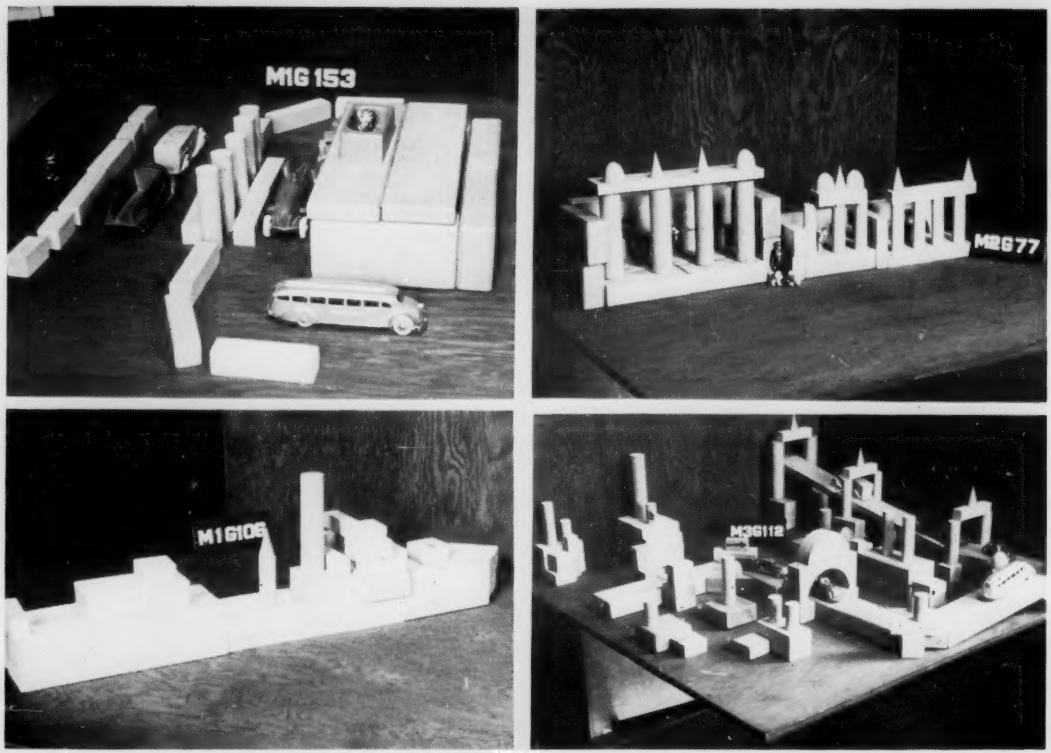


FIGURE 2

While the child worked on his scene, the observer sat at his desk, presumably busy with some writing. When the child gave a sign that the scene was completed, the observer said, "Tell me what it's all about" and took notes on what the child said. He then mildly complimented the child on his construction. After the child had left the room, the scene was sketched or photographed.

The reference to moving pictures had the following purposes: it underscored the request for a dramatic incident and thus set a standard against which the degree of excitement or lack of excitement in the final scene could be judged. This was deemed necessary because, unlike the traumatized children who, as patients, offer play scenes in clinical situations, these children lack an important inducement to "let go" in these constructions, unless they happen to be temperamentally or accidentally motivated to do so.

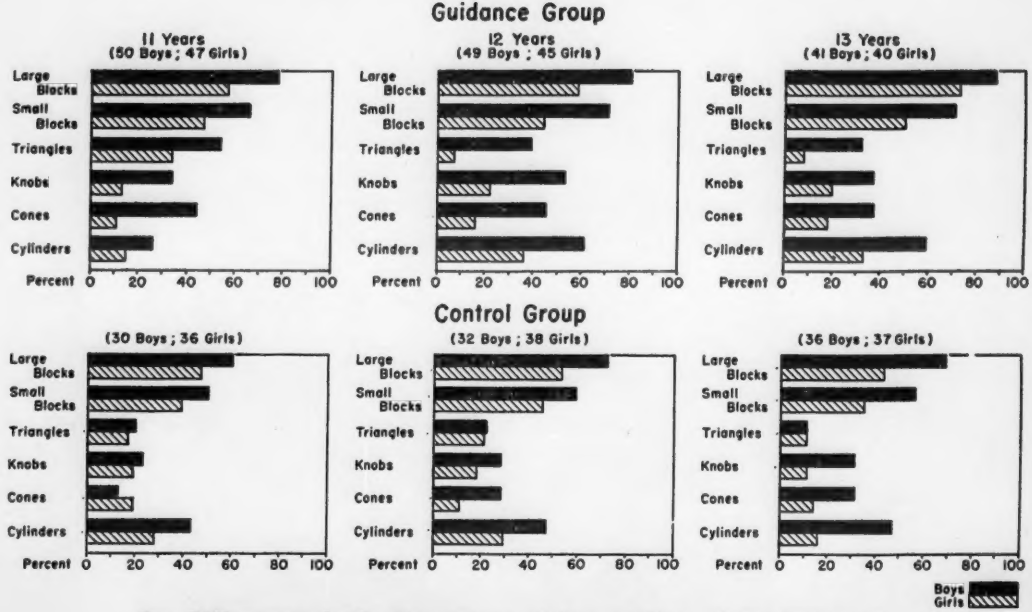
Results

Of the 126 children originally included in the *Guidance Group* at 21 months, 97 participated in the "play" session at 11 years, 94 at 12 years, and 81 at 13 years. Play protocols were obtained from 66 of the 126 children in the *Control Group* at 11 years, 70 at 12 years, and 73 at 13 years. This reduction in the sample is the result of families moving from Berkeley, losing interest in the study, or failure to obtain a good photograph of the play construction. However, these groups are sufficiently large to provide normative data for boys and girls which, if substantiated in the two groups, may be considered reliable.

Inspection of the photographs of the children's play constructions suggests marked individual differences in the use of the available materials, but noticeable also are rather wide sex differences in the materials selected and the use which is made of them. Four examples of constructions which are fairly typical of those made by the girls are shown in Figure 1. Scenes depicted in this figure are two home interiors, a school room, and a playground scene. These four examples suggest the tendency, which was general for the girls, to use only the family figures, furniture, and a few blocks to construct scenes closely related to the home.

The boys' constructions, on the other hand, are more varied and tend to depict more daring and imaginative scenes. The four constructions in Figure 2 show a filling station, zoo, boat, and town showing the factory area. The boys' tendency to use many blocks, vehicles, and persons in uniform rather than family figures is shown in these pictures. The consistency and extent of the sex differences suggested by these examples is shown in Figures 3 to 9 and Tables I to VI.

Blocks. A larger percentage of the boys used blocks in their play constructions at all ages (11, 12, and 13 years). This sex difference tends to



Sex Differences in the Occurrence of One or More of the Different Types of Blocks in Play Configurations

FIGURE 3

hold true for both groups (*Guidance* and *Control*) and for every type of block (large, small, triangles, knobs, cones, and cylinders). There is only one minor exception to this trend. At 11 years (in the *Control Group* only), more girls than boys used the cone-shaped blocks.

We found that not only do more of the boys use blocks in their constructions, but *they use more of them*. Table I shows the results for the *Guidance* children at 11 years. These 11-year-old boys use, on the average, ten

TABLE I

SEX DIFFERENCES IN THE AVERAGE NUMBER OF BLOCKS USED IN PLAY CONFIGURATIONS — GUIDANCE GROUP — 11 YEARS

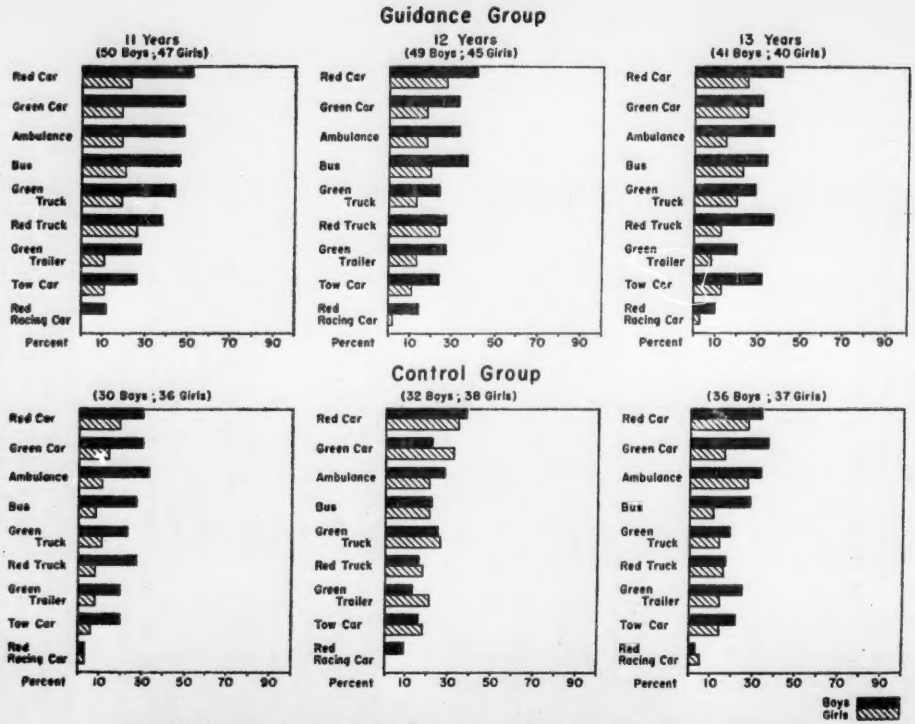
Type of Block	*Boys* $n=50$ *Mean*	*Girls* $n=47$ *Mean*	*Diff.*	*Diff.* / *S.E.*DIFF.
Large Blocks	9.66	7.65	2.01	1.28
Small Blocks	10.42	7.00	3.42	1.61
Cylinders	2.76	1.47	1.29	1.80
Triangles	.62	.28	.34	1.73
Cones	.98	.36	.62	2.22
Knobs	1.00	.26	.74	3.30

large blocks, ten small blocks, three cylinders, one cone, and one knob in their constructions. The girls use significantly fewer of all of these types of blocks (critical ratios range from 1.3 for large blocks to 3.3 for the knob-shaped blocks).

Vehicles. In Figure 4, the per cent of boys including each of the nine vehicles (one red and one green car, one red racing car, one green trailer, one tow car, two trucks, one bus, and one ambulance) in their play constructions is contrasted with the per cent for girls at ages 11, 12, and 13 years. A larger percentage of the boys in both the *Guidance* and *Control Groups* used each of the nine vehicles at ages 11 and 13 years. At 12 years, the sex differences are not clear-cut in the *Control Group,* but are in the *Guidance Group* where we find a larger percentage of boys than girls using each vehicle.

Not only do more of the boys use vehicles in their constructions, but *they used more of them.* Table II shows that whereas the boys in the *Guidance Group* at 11 years averaged 3.4 vehicles per construction, the girls averaged 1.5 (critical ratio is 3.6, and the difference is significant at the .0003 level of confidence). The results are consistent for both groups at all three age levels.

The extent of the sex differences in the use of vehicles may also be shown



Sex Differences in the Occurrence of Vehicles in Play Configurations

FIGURE 4

TABLE II

SEX DIFFERENCES IN THE AVERAGE NUMBER OF VEHICLES IN PLAY CONFIGURATIONS

Age in Years	GUIDANCE					CONTROL				
	Boys		*Girls*		*Diff.*	*Boys*		*Girls*		*Diff.*
	n	*Mean*	*n*	*Mean*	*S.E.*DIFF.	*n*	*Mean*	*n*	*Mean*	*S.E.*DIFF.
11	50	3.42	47	1.49	3.61	30	2.13	36	.89	2.07
12	49	2.59	45	1.47	1.99	32	1.88	38	1.21	.99
13	41	2.71	40	1.43	2.11	36	2.17	37	1.43	1.23

by comparing the per cent of boys versus girls using one or more vehicles in their constructions:

At 11 years, 66% of the boys versus 43% of the girls (*G Group*)
50% of the boys versus 28% of the girls (*C Group*)

At 12 years, 53% of the boys versus 38% of the girls (*G Group*)
41% of the boys versus 41% of the girls (*C Group*)

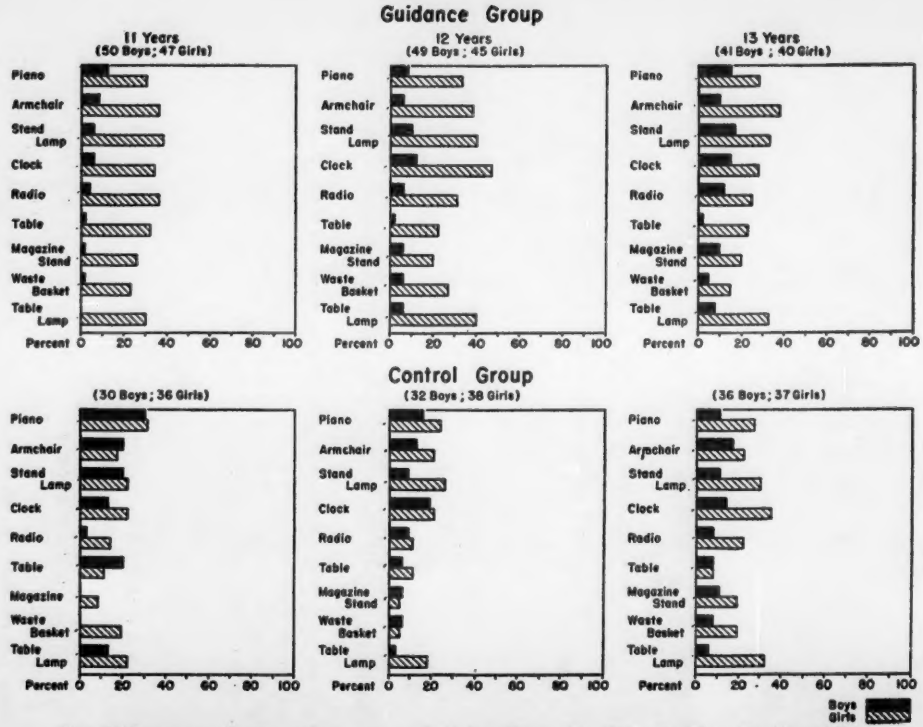
At 13 years, 51% of the boys versus 37% of the girls (*G Group*)
50% of the boys versus 32% of the girls (*C Group*)

Furniture. In contrast to the findings for blocks and vehicles, more girls than boys used each item of doll furniture. The exceptions to this trend are minor. At 11 years, more boys than girls (*Control Group* only) used the *table*; and at 12 years, the *magazine stand* and *waste paper basket* were included by more boys than girls (true for *Control Group* only). The average number of pieces of furniture in the girls' constructions was 10.4, in contrast to 2.6 for the boys in the *Guidance Group* at 11 years (the critical

TABLE III

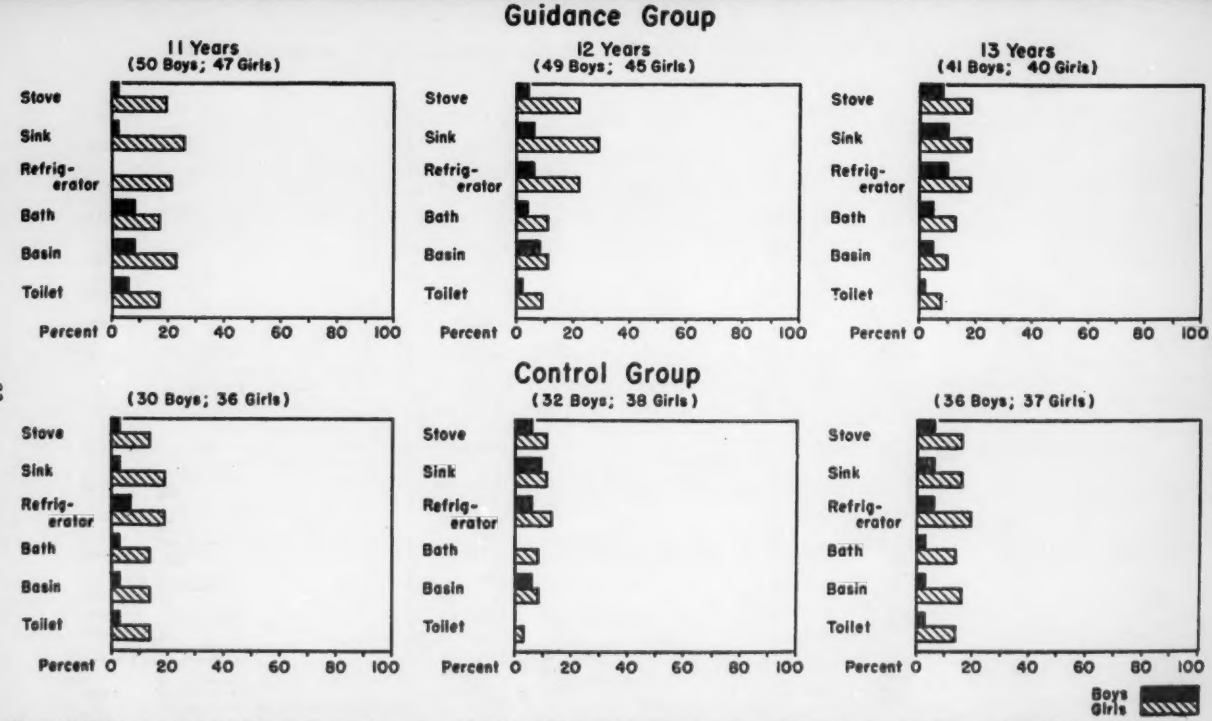
SEX DIFFERENCES IN THE AVERAGE NUMBER OF PIECES OF FURNITURE IN THE PLAY CONFIGURATIONS

Age in Years	GUIDANCE					CONTROL				
	Boys		*Girls*		*Diff.*	*Boys*		*Girls*		*Diff.*
	n	*Mean*	*n*	*Mean*	*S.E.*DIFF.	*n*	*Mean*	*n*	*Mean*	*S.E.*DIFF.
11	50	2.62	47	10.38	—4.77	30	3.90	36	7.67	—1.95
12	49	3.14	45	10.60	—4.26	32	3.91	38	5.97	—1.30
13	41	3.40	40	8.88	—2.80	36	3.92	37	8.46	—2.21



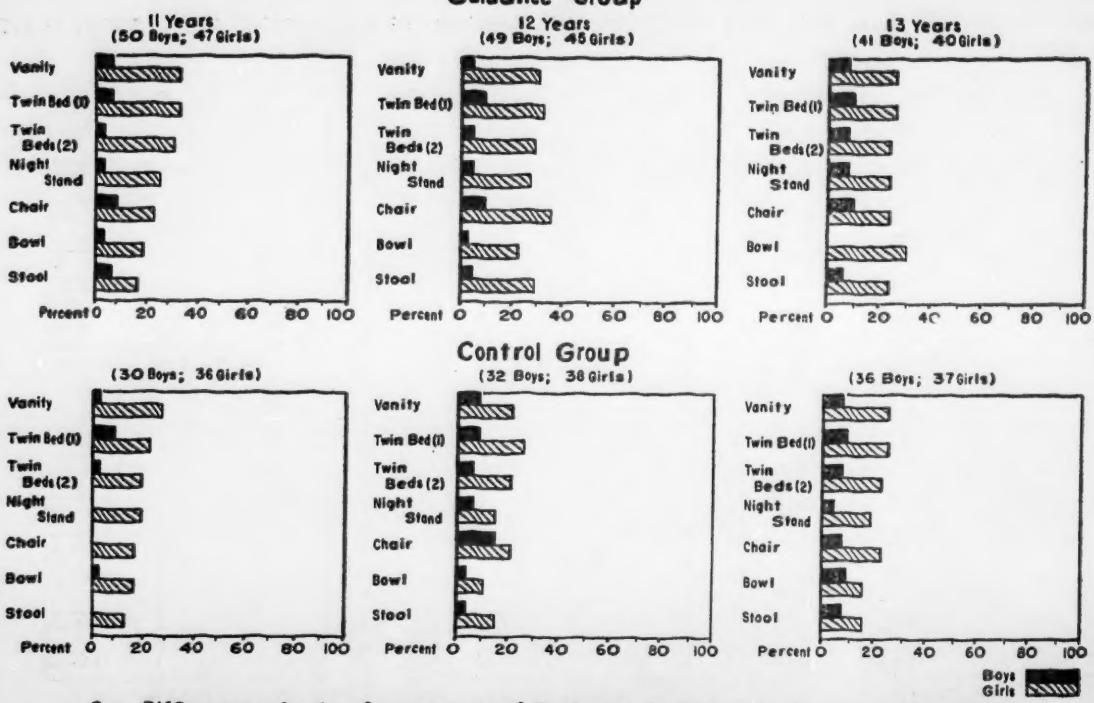
Sex Differences in the Occurrence of Living Room Furniture in Play Configurations

FIGURE 5



Sex Differences in the Occurrence of Kitchen and Bathroom Furniture in Play Configurations

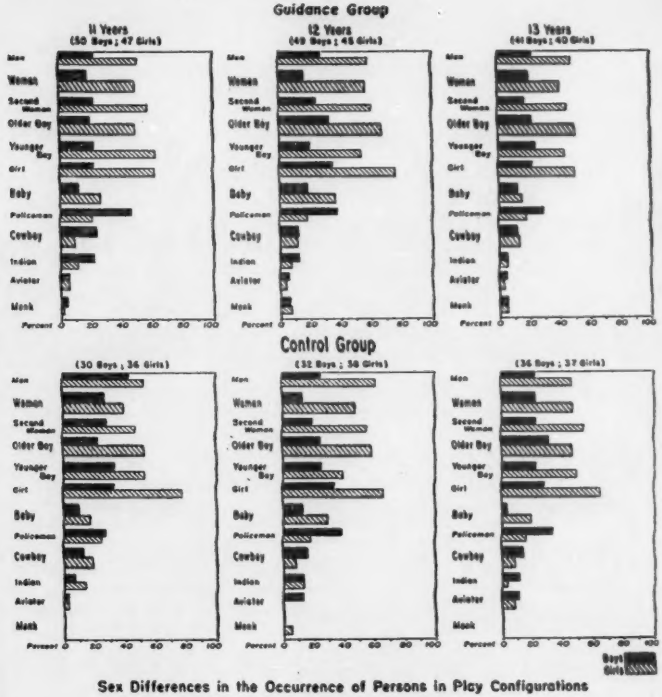
FIGURE 6



Sex Differences in the Occurrence of Bedroom Furniture in Play Configurations

FIGURE 7

ratio based on these means is 4.8). The differences are less marked in the *Control Group*; nevertheless, there is a consistent trend in the direction of more girls at every age using the furniture and to use more of it. The results shown in Figures 6 and 7 indicate how few of the boys were interested in the bathroom and kitchen furniture.

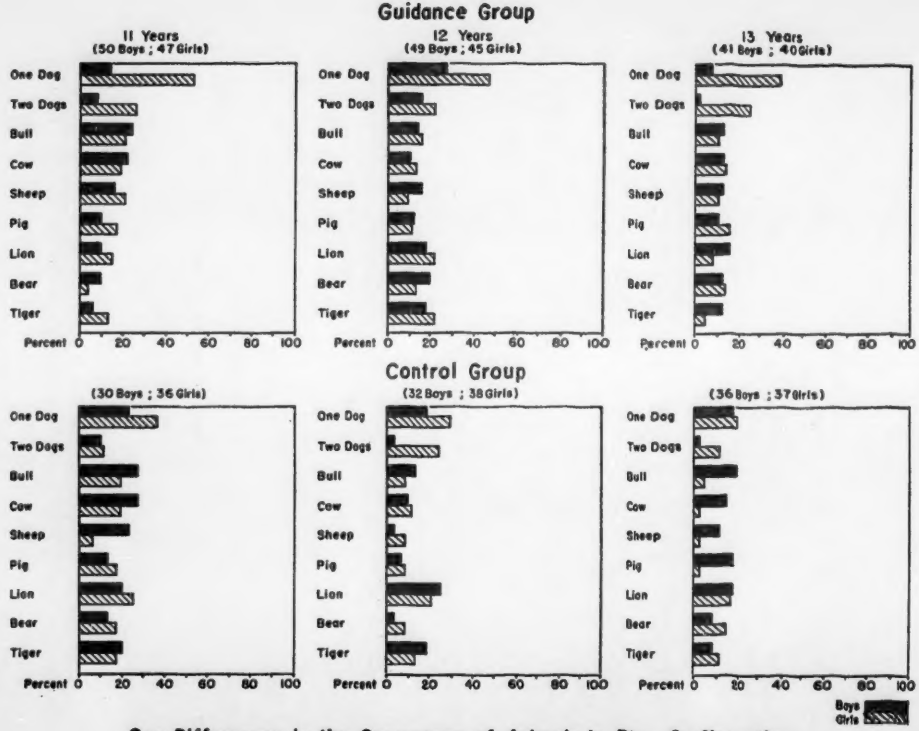


Sex Differences in the Occurrence of Persons in Play Configurations

FIGURE 8

Persons. Contrasting sex differences are to be seen in Figure 8. More girls than boys include persons-in-ordinary-dress (or family figures) in their play configurations. That is, not only do more of the girls include the two women, girl, and baby, but also the man and two boys. Boys include one person-in-ordinary-dress in their constructions (on the average), while the girls include (on the average) roughly three and a half persons (see Table IV).

In contrast to this finding, more boys than girls include persons in uniform (the policeman, cowboy, Indian, and aviator). The pilot and monk



Sex Differences in the Occurrence of Animals in Play Configurations

FIGURE 9

TABLE IV

SEX DIFFERENCES IN THE AVERAGE NUMBER OF PERSONS IN SPECIAL DRESS (POLICEMAN, PILOT, MONK, COWBOY)

Age in Years	GUIDANCE					CONTROL				
	Boys		*Girls*		*Diff.*	*Boys*		*Girls*		*Diff.*
	n	*Mean*	*n*	*Mean*	*S.E.DIFF.*	*n*	*Mean*	*n*	*Mean*	*S.E.DIFF.*
11	50	1.02	47	.49	2.73	36	.50	36	.61	— .57
12	49	.73	45	.44	1.52	32	.78	38	.45	.61
13	41	.56	40	.43	.85	36	.69	37	.41	1.42

figures used in this study were not impressive and were ignored by most of the children. The sex differences with respect to persons in special dress are not so clear as those noted for the family figures. That is, the girls make greater use of the family figures than the boys make of the persons in uniform or special costumes.

Animals. Two little dogs, farm animals (bull, cow, sheep, and pig), and three wild animals (lion, bear, and tiger) were among the toys available for inclusion in the dramatic sets. Only one significant and consistent sex difference is to be noted in the use of these animals, and that is that the girls show a greater tendency to use the little dogs in their constructions than do the boys (see Figure 9). This fact is consonant with the finding that the girls make greater use of the house furniture. The little dogs fit appropriately into the indoor scenes constructed by the girls.

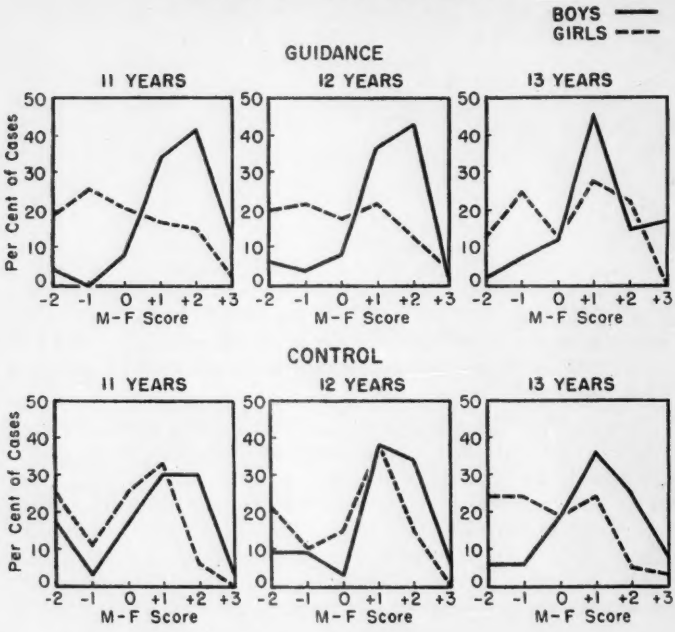
MASCULINITY-FEMININITY SCORES

A rough masculinity-femininity score was suggested by the fact that boys show a greater tendency to use blocks, vehicles, and persons-in-uniform; and girls use house furniture and persons-in-ordinary-dress. An M-F score was therefore derived which equals the algebraic sum of the following:

+ 1 for one or more blocks
+ 1 for one or more vehicles
+ 1 for one or more persons in uniform
— 1 for one or more persons in ordinary dress
— 1 for one or more pieces of furniture

The M-F scores range from — 2 (very feminine score) to + 3 (very masculine score). A boy (or girl) who used only blocks, vehicles, and persons in uniform in his construction would be given a score of + 3 (highly masculine score); and a girl (or boy) who used only family figures and furniture would be given a score of — 2. Of course, a great many children used

SEX DIFFERENCES IN THE DISTRIBUTIONS OF M-F SCORES ON THE PLAY CONFIGURATIONS



LEGEND:

M-F Score equals the algebraic sum of the following:

+1 for one or more blocks.
+1 for one or more vehicles.
+1 for one or more persons in uniform.
−1 for one or more persons in ordinary dress.
−1 for one or more pieces of furniture.

Scores range from −2 (very feminine score) to +3 (very masculine score)

FIGURE 10

materials assigned plus as well as items assigned minus values. The scores for such constructions were the algebraic sum of the plus and minus scores.

In Figure 10, the distributions of these masculinity-femininity scores for boys and girls have been compared. The sex differences are noticeable at all three age levels and in both groups, but are more marked at 11 years for the children in the *Guidance Group* and at 13 years in the *Control Group*. However, the tendency for more of the boys to earn positive or masculine scores, and for more of the girls to earn negative or feminine scores, is clear cut at all three age levels and for both groups. The probability that these

TABLE V

SEX DIFFERENCES IN THE AVERAGE NUMBER OF PERSONS IN ORDINARY DRESS USED IN PLAY CONFIGURATIONS

Age in Years	GUIDANCE					CONTROL				
	Boys		Girls		Diff.	Boys		Girls		Diff.
	n	Mean	n	Mean	S.E.DIFF.	n	Mean	n	Mean	S.E.DIFF.
11	50	1.38	47	3.55	—4.63	30	1.97	36	3.39	—2.81
12	49	1.73	45	4.04	—4.94	32	1.53	38	3.55	—4.02
13	41	1.39	40	2.90	—2.84	36	1.50	37	3.19	—3.27

TABLE VI

SEX DIFFERENCES IN THE AVERAGE NUMBER OF ANIMALS IN PLAY CONFIGURATIONS (COW, BULL, SHEEP, PIG, BEAR, TIGER, LION)

Age in Years	GUIDANCE					CONTROL				
	Boys		Girls		Diff.	Boys		Girls		Diff.
	n	Mean	n	Mean	S.E.DIFF.	n	Mean	n	Mean	S.E.DIFF.
11	50	1.10	47	1.21	— .29	30	1.57	36	1.19	.67
12	49	1.16	45	1.11	.13	32	.81	38	.76	.12
13	41	1.05	40	1.48	— .98	36	1.28	37	.86	.88

TABLE VII

SEX DIFFERENCES IN M-F SCORES

Age Level	Boys		Girls			Level of Significance
	n	Mean	n	Mean	C.R.	
			GUIDANCE GROUP			
11	50	1.46	47	—.11	6.2	<.001
12	49	1.12	49	.00	4.1	<.001
13	41	1.15	40	.22	3.2	.001
			CONTROL GROUP			
11	30	.63	36	—.17	2.6	.01
12	32	.97	39	.18	2.4	.02
13	36	.94	37	—.30	4.4	<.001

differences are not due to chance is shown by a comparison of the mean M-F scores in Table VII. The critical ratios range from 2.4 to 6.2.

Since the sex differences in the *Guidance Group* are greatest at 11 years and in the *Control Group* at 13 years, it was thought that there might be a difference in maturity in the two groups. This hypothesis was tested by comparing the average age of menarche for the girls, and the per cent of mature height achieved by both boys and girls at ages 11 and 13 years. The average age of menarche for the girls in the *Guidance Group* was 12.72 years, and for the girls in the *Control Group,* 12.78 years. The per cent of their mature height achieved by ages 11 and 13 years for the boys and girls in the two groups is as follows:

	Per Cent of Mature Height Achieved by:	
	11 years	*13 years*
Guidance Girls	89 %	96 %
Control Girls	88 %	96 %
Guidance Boys	81.2%	87.6%
Control Boys	81.6%	87.9%

We conclude that the negligible differences in the average maturity level of the boys and girls in the two groups could not possibly account for the greater sex differences noted in the *Guidance* than in the *Control Group.*

Somatic Androgyny in Relation to the Masculinity-Femininity Scores

Inspection of Table VII suggests a further possibility for the group differences obtained. It will be noted that the average M-F scores for the girls in the two groups are highly comparable, but the boys in the *Guidance Group* have more masculine scores than do the boys in the *Control Group.* One method of evaluating the masculinity of the *Guidance Group* boys is to compare the somatic androgyny assessments of the boys in the two groups according to the method developed by Bayley and Bayer (1). The ratings of androgyny were made on the basis of photographs of the boys in late adolescence:

Assessment of Somatic Androgyny	*Guidance*		*Control*	
	n	%	n	%
Hypermasculine	8	*19*	4	*13*
Masculine	20	*49*	20	*64*
Masculine with bisexual or asexual components	13	*32*	7	*23*
	41	*100*	31	*100*

This comparison indicates that a larger proportion of boys in the *Guidance Group* were considered "hypermasculine"; however, there are also more boys in this group with bisexual and asexual components in their body build. In other words, the *Guidance* boys appear to be a more heterogeneous group with respect to somatic androgyny. This group difference in androgyny may quite possibly account for some of the discrepancy in the sex differences noted in the two groups.

The next step is to relate the androgyny assessments to the M-F scores on the play configurations. The distribution of M-F scores for each category on the androgyny scale has been compared in Table VIII. There is no correlation between androgynic score and M-F score for the boys, but it is of interest to note that the three boys who earned the highest possible masculinity scores (+3) on the play configuration scale at ages 11, 12, and 13 years are either considered "masculine" or "hypermasculine" on the androgyny scale. This trend, however, is counterbalanced by the distribution of androgyny assessments for the +2's. And it will be noted that the average M-F score of +1, obtained by the 12 boys with hypermasculine body build, is lower than that obtained by the boys with masculine, or masculine-with-asexual-or-bisexual elements.

The relationship between the M-F scores and androgynic assessments for the girls is in the expected direction, although not significant statistically. The five girls who obtained highly masculine scores (+2 or +3) on the Play M-F scale are either feminine or feminine-with-asexual-or-bisexual components, but none is considered hyperfeminine in body build.

We may conclude that although there is no general relationship between the M-F scores on the play configurations and body build, the findings for children at the extremes are suggestive. Specifically, the tenuous trend is in the direction of the *most masculine* M-F scores, based on the play protocols, being obtained by highly masculine-looking boys and the less feminine (that is, more masculine-appearing) girls.

Reputation with Classmates in Relation to the Masculinity-Femininity Scores

Whenever we note differences in the distributions of responses of boys and girls to a test, such as the Play Configurations, we cannot help but wonder about other characteristics of the boys and girls who earn the extreme scores. In other words, is the girl who earns a highly feminine score at every age level on the play configurations a girl who is considered very feminine by other criteria? And what are the characteristics of girls who build play constructions which are "boyish" in character? Only two girls obtained the most feminine score of —2 at all three age levels (cases 470 and 490). The highest score at the masculine end of the scale was earned by a girl, case 796, who obtained a score of +3 at two age levels and +2 at the third. We thought it would be of interest to see whether these three

TABLE VIII

RELATION OF M-F SCORES TO ASSESSMENTS OF SOMATIC ANDROGYNY

Average M-F Score For Ages 11, 12, and 13 Years	GIRLS — ASSESSMENTS OF SOMATIC ANDROGYNY						BOYS — ASSESSMENTS OF SOMATIC ANDROGYNY					
	Hyper-Feminine		*Feminine*		*Feminine With Asexual or Bi-sexual Components*		*Masculine With Asexual or Bi-sexual Elements*		*Masculine*		*Hyper-Masculine*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
+3	..	..	..	..	1*	*3*	..	..	2	*5*	1	*8*
+2	..	..	2	*6*	2	*5*	7	*35*	13	*33*	2	*17*
+1	2	*18*	9	*30*	11	*29*	9	*45*	18	*45*	6	*50*
0	3	*27*	11	*37*	8	*21*	3	*15*	3	*8*	2	*17*
−1	5	*45*	5	*17*	11	*29*	1	*5*	2	*5*	1	*8*
−2	1	*9*	3	*10*	5	*13*	..	..	2	*5*	..	..
Average M-F Score	11	−.5	30	.1	38	−.1	20	1.1	40	1.3	12	1

* Case 796—note her classroom reputation in elementary school.

girls are considered "Tomboys" or "Little Ladies" by their classmates (5).

The reputation test was given at certain grade levels in most of the elementary schools attended by the Guidance Study children. Fortunately, we have reputation test scores for two of the girls (cases 490 and 796) at two grade levels. These girls went to different elementary schools; so they are being judged by different groups of children:

Case 490 (who obtained highest possible femininity score on the Play at ages 11, 12, and 13 years) received the following votes from her classmates:

In grade II, aged 8 years, case 490 was voted as being a "Little Lady" by four boys and two girls (that is, 6 out of the 24 children in the class, or 25% of the group). Only one girl thought case 490 was a "Tomboy."

In grade V, at 10 years 7 months, the teacher, three boys, and five girls all thought of case 490 as a "Little Lady" (8 out of the class of 41 children, or 20%).

Case 796 (who obtained the most highly masculine score of any girl on the Play at ages 11, 12, and 13 years and who was judged to have a bisexual body build at maturity) had the following reputation in her second and fourth grade classrooms:

In grade II, case 796 at the age of 8 years: the teacher, four boys, and four girls, and case 796 herself, voted her as a "Tomboy" (that is, liking to play boys' games and to do the things boys do). (Since there were 29 in the class, this represents 28% of the class votes.)

In grade IV, aged 9 years 9 months, the teacher, 17 girls, and nine boys, and case 796 herself, all voted her a "Tomboy." There were 36 children in this class so that 26 votes represents 72% of the class votes.

Only one other girl, case 327 in the *Guidance Group* obtained as many votes for being a "Tomboy" as did case 796. Case 327 also earned a highly masculine score on the Play. Largely as a result of these extreme scores, the correlation between the Play M-F score and reputation with classmates on the paired item "Tomboy" vs. "Little Lady" is .41 for the 29 girls in the *Guidance Group* for whom scores on both tests were available. This coefficient was reduced to .11 when the cases 327 and 796 were omitted from the correlation plot. The correlation for the girls in the *Control Group* is —.08 for 33 girls.

No relation was obtained between the boys' reputation for being a "Real Boy" and the M-F scores (r for the *Guidance* boys is .11, and the *Control* boys, .04).

We would conclude that there is no general trend toward a relationship between the play protocol M-F scale and reputation with classmates as being "Real Boys" or "Little Ladies." However, two girls with extreme M-F scores had reputations with their teachers and classmates in elementary school which were highly consonant with their M-F scores.

Summary and Interpretations

Sex differences in the extent to which blocks, vehicles, doll furniture, and doll figures and animals were included in the play constructions of preadolescents have been shown for two groups of children, matched in early childhood on certain socio-economic data. Since similar results were obtained for the two groups (termed *Guidance* and *Control*), we conclude that our findings are reliable and would be duplicated under comparable conditions of testing. An interesting finding was the fact that not only did more boys use blocks and vehicles at all ages, but they used more of them. Similarly, a larger proportion of the girls used the furniture and family figures, and they used them in greater number than did the boys.

A masculinity-femininity scale based on these findings has been derived. Sex differences on this scale were found to be statistically significant at confidence levels varying from .02 to .001, and to be most marked at 11 years in one group and at 13 years in the second group. This age difference could not be accounted for on the basis of maturity.

Ratings of somatic androgyny were not generally related to the M-F scores, but we did find that the boys and girls with the most masculine body builds obtained highly "masculine" scores on the play protocol M-F scale.

Reputation with classmates as being a "Real Boy" or a "Little Lady" was found to be unrelated for the group as a whole to the M-F scores, but the girls who obtained highly masculine or feminine scores on the play were considered by their classmates and teacher to be, respectively, "Tomboys" or "Little Ladies."

Conclusion

We believe that the use of the play materials reported in this study are to some extent a function of the content of the play scenes presented, and that sex differences in this content are consonant with the roles boys and girls are expected to play in our culture, and thus have little direct relation to biological differences. Boys, however, are more active at all ages and in all pursuits, and they show a greater range of behavior in their pursuits than do girls, a difference which would appear to be the result of physio-biological rather than cultural factors. This difference is reflected in the play protocols. The boys' constructions suggest a greater output of energy and more varied use of the materials. The girls, on the other hand, portrayed more passive peaceful indoor scenes using the furniture and family figures.

References

1. Bayley, Nancy and Bayer, Leona M. The assessment of somatic androgyny. *Amer. J. phys. Anthropol.*, 1946, N.S. 4, 433-462.

2. Erikson, E. H. Configurations in the play constructions of a representative group of preadolescents. Manuscript at the Institute of Child Welfare, University of California, Berkeley.

3. Macfarlane, Jean W. Studies in child guidance. I. Methodology of data collection and organization. *Monogr. Soc. Res. Child Develpm.*, 1938, 3 (6).

4. McFate, Marguerite Q. and Orr, Frances G. Through adolescence with the Rorschach. *Rorschach Res. Exch. J. Proj. Tech.*, 1949, 13 (3), 302-319.

5. Tuddenham, R. D. The meaning of differences in reputation among elementary school children. Unpublished Ph.D. thesis, Univ. Calif., 1941.

6. Yarrow, L. J. The effect of antecedent frustration on projective play. *Psychol. Monogr.*, 1948, 62 (6).

Manuscript received July 19, 1950.

SOCIAL CLASS DIFFERENCES IN PARENTAL ATTITUDE TOWARD SCHOOL AT GRADE I LEVEL

CELIA BURNS STENDLER

Bureau of Research and Service, College of Education
University of Illinois

This is a report of a study of social class differences in parental attitudes toward school at Grade I level. It is part of a larger study dealing with the impact of beginning first grade upon socialization. The first of several reports is already in press dealing with changes in the child's concept of self and changes in his behavior after school entrance as reported in parent interviews (4). These interviews also yielded data on parental belief in and support of the school. These data were analyzed for possible social class differences and results will be reported in this paper.

The hypothesis to be tested was: There are social class differences in parental belief in and support of the school at Grade I level. We were interested in testing this hypothesis since differences in parental attitude might make a difference in whether the child accepted the school as a socializing agency. It was conceivable that in homes where there was wholehearted support of school and teacher, the child might see both agencies as presenting a united front with respect to the values he is to accept. With the school reinforcing the home teaching, chances of the child's coming to accept these values would be great. In other families where the home did not reinforce the values of the school, it was conceivable that the child might not accept the teacher as a socializing agent, or might accept the teacher and come to reject his parents with subsequent effects upon socialization.

In sociological literature we frequently find such differences in parental attitude postulated. Havighurst and Taba (2) point out that there are social class differences in the faith which people have in education. Upper-middle-class members are great believers in education, and in education as the solution to social problems, while lower-middle and upper-lower classes look upon school simply as a means of getting children ready for adulthood. They are not great believers in education per se, but see it as necessary for vocational success (2, p. 30-33). All of these groups, though to a varying degree, reinforce the values of the school because they expect the school to do something for their children. In sharp contrast to these attitudes toward education is that of the lower-lower class. Distrust and suspicion are generally accredited to this group, together with a rejection of school and what

it stands for. What this means in practice for the slum child is described by Davis (1, p. 30):

> . . . Whereas the middle-class child learns a socially adaptive fear of receiving poor grades in school. of being aggressive toward the teacher, of fighting, of cursing, and of having early sex relations, the slum child learns to fear quite different social acts. His gang teaches him to fear being taken in by the teacher, of being a softie with her. To study homework seriously is literally a disgrace. Instead of boasting of good marks in school, one conceals them if he ever receives any.

This particular study was an attempt to spell out social class differences in parental belief in and suport of the school in five different areas:

1. *Preschool attendance.*—Since nursery-kindergarten is not compulsory, attendance at preschool might be interpreted as an indication of parental belief in education, and vice versa.
2. *Parental educational aspirations for the child.*—Parents who believed in education might not only extend education downward into preschool but also upward beyond the legal leaving age.
3. *Preparation for school.*—Possible social class differences were anticipated in the way in which parents prepared children for school. Those parents who were firm believers in education might conceivably prepare children for first grade by teaching them cetain skills or helping them to anticipate the new experience.
4. *Parental criticism of school.*—Social class differences might conceivably be anticipated in this area, but take rather an involved form. Those parents with little or no faith in education might be openly critical of the schools; other parents who had expected the school to fulfill certain expectations and who had found the school wanting, might be critical, also. But their criticisms might take a different form and might not be expressed as freely. Wanting to maintain a united front with the schools as far as their children were concerned, they might even rationalize certain school practices which children questioned.
5. *Parental reception of report card.*—Since the report card is an important indicator of how well the school thinks the child is doing, in those homes where the values of the school were reinforced the card would be seriously received, with good reports approved, and poor reports frowned upon.

Procedure

Two interviews were conducted with mothers of first grade children, one interview just prior to the child's entrance to first grade; the second after he had been in school for approximately two months and had received his first report card. The interviews were carried out in a midwestern community by ten different interviewers. A sample of public school was taken, then a sample of 250 perents whose children were to enter first grade in

the fall. Two interviews were completed with 212 of this group. Median age of the group was 6.3 years as of September 1, just prior to entering school.

Using the technique worked out by Warner, Meeker, and Eells (5), the parents were typed as to social class. Occupation, house type, dwelling area and source of income were used in class typing. Five social classes were defined with distribution as follows:

Social Class	*Per Cent*	*Number of Families*
Upper	4	9
Upper-middle	24	51
Lower-middle	29	61
Upper-lower	36	76
Lower-lower	7	15

The questions in the two interviews which were analyzed for this paper were as follows:

1. Preschool attendance:
   Did the child attend preschool: Which one and for how long?
   What were the reasons for sending the child, or for not sending him?
2. Parental aspirations for the child:
   How far do you expect the child to go in school?
3. Preparation for school:
   What has he been taught before going to school?
   alphabet? nursery rhymes? writing name? reading? numbers? other?
   What has he been taught about behaving in school?
   toward the teacher? other children?
4. Parental criticism of school:
   Does the child ever say anything critical about school? about his teacher? What?
   What does the parent say when the child asks questions or criticizes the school? (Support the school, or point out that school is wrong)
   Does the school insist upon some rules and regulations you can't see any sense in yourself? What? What do you say about them to the child?
5. Parental reception of report card:
   Did the child receive his report card yet? What did you say to him when you saw the report?

Results and Discussion

1. *Preschool attendance.*—Preschool facilities at the five-year-old level in the community in which this study was carried on were not part of the public education system. There were at least six private nursery schools, all of which charged tuition, a tuition-free University nursery school primarily for student-veterans, and a number of kindergartens operated in public school buildings by Parent-Teacher Associations, for which a monthly charge of $5 per pupil was made.

Parents were asked in the first interview if their child had attended preschool, and the reasons for sending or not sending him. As can be seen by the figures below, a child's chances of attending preschool decrease as one goes down the social ladder. While all uppers spent some time in kindergarten, only two of the lower-lowers had the same opportunity.

Social Class	*Per Cent Attending Preschool*	*Number of Children*
Upper	100	9
Upper-middle	98	50
Lower-middle	73	44
Upper-lower	31	24
Lower-lower	14	2

The reason most commonly advanced for not sending a child to preschool was that of cost. Yet it is difficult to explain the striking differences among social classes in preschool attendance solely on the basis of finances. Undoubtedly there were families where the $5 monthly tuition charge would have meant a hardship, but this was probably as true for some lower-middle class families as for upper-lower class families. While we did not have figures on income for different social class groups, knowing the prevailing wage rates for different occupations in the community, it is safe to assume some overlap between social classes. Mr. X, who drove a bakery truck and was upper-lower class, earned a weekly salary, before deductions, of $48 per week; his child had not attended kindergarten. Mr. Y, who was a part-time teaching instructor, earned $50 per week, but his child attended kindergarten. Both families were one-child families. While the economic factor in preschool attendance cannot be overlooked, for some lower-class families it would seem likely that lack of preschool was due only partly to finances and that an additional factor to be considered might be that these families were not thoroughly sold on kindergartens but preferred to spend their money in keeping with their particular values. It should be mentioned also that the reason "can't afford kindergarten" was given by some parents in all social class groups, except in the upper class.

Since most of the parents sending children to kindergarten were upper

or middle class, when we asked for reasons for sending children, our responses came largely from upper- and middle-class parents. Reasons given included (1) to improve social adjustment, (2) to prepare for first grade, and (3) kindergarten is something one accepts without question these days and "everybody" sends his child. The two lower-lower class families whose children attended kindergarten sent them because of speech defects. Reasons other than financial for not sending children were expressed in terms such as, "They're in school long enough"; "I've got a kindergarten here at home with two of them." Explanations such as these were given by parents in all social classes except upper. In other words, while there were social class differences in preschool attendance, reasons for sending or not sending children showed no discernible social class trend.

2. *Parental educational aspirations for the child.*—Data on the question, "How far do you expect your child to go in school?" supported the picture of social class differences in educational background given in other studies. Here are the results:

Expect child to go	*Upper* (9 cases) %	*Upper-Middle* (51 cases) %	*Lower-Middle* (61 cases) %	*Upper-Lower* (76 cases) %	*Lower-Lower* (15 cases) %
"As far as he can"	12	4	6	16	50
Through high school	0	2	8	18	50
Beyond high school	0	4	10	24	0
Through college	87	89	76	41	0

TABLE I

PERCENTAGES OF DIFFERENT SOCIAL CLASSES REMAINING IN SCHOOL AT HIGH SCHOOL LEVEL*

Class	In School *Number*	*Per Cent*	Out of School *Number*	*Per Cent*
Upper	4	100.0	0	00.0
Upper-middle	31	100.0	0	00.0
Lower-middle	146	92.4	12	7.6
Upper-lower	183	58.7	129	41.3
Lower-lower	26	11.3	204	88.7
TOTAL	390	53.1	345	46.9
$X^2 = 294.0954$	$P < 0.01$	$C = 0.53$	$\overline{C} = 0.73$	

* Hollingshead, August B., *Elmtown's Youth*, New York: John Wiley and Sons, Inc., 1949, p. 330.

As the data show, more than twice as many upper-class parents expect their child to go to college as do upper-lower-class parents. Not one lower-lower mentioned college expectancy specifiically, but half of this group expects their child to finish high school. These figures are in sorry contrast to reality. At the high school level, Hollingshead (3, p. 300) found the percentages shown in Table I of different social classes still remaining in school. If lower-lower and upper-lower children now entering school conform to the pattern which Hollingshead reports, there will be a wide discrepancy between parent-expectancy at six and reality ten years later. Only a small percentage of these same children whom parents expected to complete high school will still be in school.

3. *Preparation for school.*—As indicated in the section on procedures, parents were asked certain specific questions with regard to what they taught their children before school began. Items selected were teaching of the alphabet, counting, reading, writing one's name, and nursery rhymes. Following are the results:

	Upper (9 cases) %	*Upper-Middle* (51 cases) %	*Lower-Middle* (61 cases) %	*Upper-Lower* (76 cases) %	*Lower-Lower* (15 cases) %
alphabet	66	38	23	24	16
nursery rhymes	100	95	92	85	66
write or print name	100	95	84	66	66
count	83	95	100	88	100
read	66	22	16	14	16

Here again the trend toward more teaching is in favor of the upper groups, with percentages steadily declining as we go down the social scale. Counting is the only activity that proved an exception. The two lower-class groups reported as high and higher a percentage of children who had been taught counting before school began. The evidence with regard to the alphabet and reading may not be as reliable as on the other items. Many mothers reported they had not taught the alphabet nor taught the child to read because the school had requested them not to do so. Whether parents actually conformed to school recommendations or only gave lip service to them was not to be ascertained.

4. *Parental criticism of school.*—Another attempt to get at social class differences in parental support of the school was by asking the questions, "Are there some rules and regulations of which you do not approve?" and "What do you say to the child when he criticizes the school?" The first question was scored on the basis of whether approval or criticisms were

expressed; with the second question, answers were scored on the basis of whether a parent defended the school or upheld the child in his criticisms.

A breakdown by social class of the 17 mothers who expressed some degree of non-support of the school showed a scattering of frequencies which did not support the hypothesis of social class difference in this area, as measured by the questions asked. This is not to deny that there may be such differences; it is likely that attitude toward the school is unconsciously expressed in a variety of ways in day-to-day living which our gross approach did not measure. It should also be kept in mind that the children had been in school only a short time, perhaps too short for criticisms to appear. The analysis by social class follows:

Class	*f*	*% of social class represented by f*
Upper	1	17
Upper-middle	2	4
Lower-middle	6	12
Upper-lower	6	9
Lower-lower	2	14

5. *Reception of report card.*—Parents' responses to the questions, "Did the child receive his report card yet? What did you say to him about the report?" were categorized under four headings: Liked report card without reservations; Accepted report card with reservations; Disappointed in report card; Report not obtained by parent. Following are sample responses for each category:

Liked report card without reservations:

"Very good. We gave her money as a reward."
"I was very pleased with the report."
"It was very good. I bragged him up to the neighbors."

Accepted report card with reservations:

"I was pleased, but he could improve and I told him so."
"It was an average card. I simply told her to improve."
"I told her I thought she could do better."

Disappointed in report card:

"I was disappointed. I'd expected better grades."
"The card was poor and I'm worried about it."
"It was bad. I reprimanded him for it."

Report not obtained by parent:

In one of the schools attended by lower class children, parent-confer-

ences were being substituted for the written report. This meant that parents had to go to school to learn of the child's progress. Reasons given by parents for not going included:

"I didn't go for the report. I was too busy."
"I've got enough to do at home."
"It's too far to walk."

Results indicated differences by social class for these categories, as can be seen below:

	Upper (9 cases) %	*Upper-Middle* (51 cases) %	*Lower-Middle* (61 cases) %	*Upper-Lower* (76 cases) %	*Lower-Lower* (15 cases) %
Liked report card without reservations	16	64	51	56	46
Accepted report card with reservations	50	35	40	36	30
Disappointed in report card..	33	0	8	6	0
Report not obtained by parent	0	0	0	1	23

Certain points stand out in these figures. Uppers were the only group in which acceptance of report card with reservations was greater than wholehearted acceptance. Uppers also had the highest percentage of parents who expressed disappointment in the report card. Lowers were the only group in which refusal to go to school for the parent-teacher conference occurred.

Interpretation of these findings must be made with caution. While uppers and lowers differed from the other groups with respect to the items mentioned above, the number of cases in each of these two social class groups was too small to generalize.

It is difficult to know, too, what interpretation might be made of the refusal of some lower-class parents to go to school for the report. This behavior would undoubtedly be interpreted as indicating indifference to the school by middle-class parents. Indeed, it is hard to conceive of middle-class mothers failing to avail themselves of such an opportunity to check on progress. It is much more typical of middle-class behavior to have report card dates clearly in mind and to make reception of the report card a big event in family life. Two possibilities suggest themselves with regard to why lower-class mothers did not go for the conference. One is general lack of support and belief in the school. If a parent does not feel that the school is really an important force in the life of her child, she is not likely to be interested in the school's evaluation of her child. On the other hand, it is rather common for lower-class mothers to be reluctant to go to the school on any occasion, which may be because they are not comfortable in such a set-

ting, because they haven't been made to feel welcome, or because their own experience as children with schools was not pleasant.

Another difficulty in interpreting remarks concerning report cards lies in the fact that a parent's attitude toward her child's progress is tied up with her level of aspiration for the child. A "B" report card might be enthusiastically accepted in a home where only "C" had been anticipated, accepted with mild pleasure where a "B" had been hoped for, and rejected by a family who had aspired to an "A" child. Because of these difficulties, no analysis of marks on a social class basis was attempted.

Future educational aspirations for a child might also affect attitude toward children's progress in school. Conceivably a parent who expected the child to go to college might hold up higher standards of achievement than a parent who anticipated at best a high school education. This might explain the high percentage of upper-class parents accepting their children's report cards with reservations. Lower-class parents on the other hand do not expect the child to go as far in school and consequently do not expect as much from the child. As one mother put it, "It was good for a kid's first grade in school. I told him to keep it up and he'll make second grade." Because their level of aspiration is lower for the child, lower-class parents accept his report without reservation and, indeed, do not take such things very seriously.

Summary and Conclusions

Data with regard to parental belief in and support of the school at Grade I level were collected by means of parent interviews and analyzed for possible social class differences. These data were in five different areas: preschool attendance, parental educational aspirations for the child, preparation for school, parental criticism of the school, parental reception of report card.

Results showed that a child's chances of attending preschool decrease as one goes down the social ladder; almost 100 per cent of uppers and upper-middles send their children to preschool, while only 14 per cent of lower-lowers send theirs. Results cannot be explained solely in terms of the economic factor but may be due to differences in the way in which different social classes regard the school.

Again, with regard to educational aspirations, parental expectations for children become less ambitious as one goes down the social ladder. Nevertheless, half of the lower-class mothers reported that they expected their children to finish high school which contrasts sharply with percentages of lower-class who do finish high school at the present time.

More upper and upper-middles prepare their children for first grade by teaching them the alphabet, nursery rhymes, writing or reading. All lower-

class parents in the study had taught their children to count, at least as far as 10.

No social class differences were found in parental criticisms of the school. It may be that the gross approach used in the study was not an appropriate measure, or it may be that the children had not been in school long enough for criticisms to develop.

Parents were found to differ somewhat according to social class in the way in which they received the first report card. Lower-class families indicated that they attached little importance to the report by not going to school for a parent conference where such a conference was substituted for a written card. Upper-class families were more likely to accept the report card with reservations and to hold up higher standards for the child.

If we accept the five areas analyzed as revealing pertinent data, it may be said that some social class differences in four of the areas do exist with regard to parental belief in and support of the school at Grade I level. What meaning these differences have for the child and how they may affect his school behavior need to be explored.

Bibliography

1. Davis, Allison. *Social-Class Influences Upon Learning*. Cambridge: Harvard University Press, 1949.

2. Havighurst, R. J., and Taba, H. *Adolescent Character and Personality*. New York: John Wiley and Sons, 1949.

3. Hollingshead, August B. *Elmtown's Youth*. New York: John Wiley and Sons, Inc., 1949.

4. Stendler, Celia Burns and Young, Norman. The impact of beginning first grade upon socialization as reported by mothers. *Child Develpm.*, 1950, 21, 241-260.

5. Warner, W. Lloyd, Meeker, Marchia, and Eells, Kenneth. *Social Class in America*. Chicago: Science Research Associates, 1949.

Manuscript received July 31, 1950.

SOME PSYCHOLOGICAL CORRELATES OF SOMATIC ANDROGYNY[1]

NANCY BAYLEY
Institute of Child Welfare, University of California

There appears to be some disagreement, among investigators of variations in masculinity and femininity, as to the presence or extent of mental-physical relations in androgynic characteristics. On the one side are those whose approach is from the physical variables of body proportions and sex characteristics. Examples are studies of Sheldon *et al.* (11, 12) and Seltzer (10). They have worked mostly with men, and have depended largely on ratings of appearance for their physical classifications. They report significantly deviant behavior in those persons whose physiques have strong components of the opposite sex.

On the other side are those who have started from the psychological variables of interest and behavior. We may cite Terman and Miles (13), Hathaway (5), and Gilkinson (4), who report generally low or insignificant relations between their psychological M-F scores and anthropometric variables, usually indices of body proportions.

Draper and his associates (3) have been interested in studying the androgynic variables within and between both sexes. They are concerned with body proportions, physiological functions, and behavior as they relate to tendencies toward certain types of disease in the individual. Their position is somewhat intermediate; they report a tendency for congruence in some, but not all, of the andric or gynic variables in any given patient.

In the present study comparisons are made between variations in masculinity and femininity in several characteristics, but primarily in M-F scores on the Kuder Interest Record, and ratings of body form. These latter are based on photographic standards developed for both sexes, and standardized in such a way that any individual, male or female, may be scored on a scale which extends from the extreme masculine through the extreme feminine (2). The sample is composed of 79 boys and 83 girls in two of the Institute's studies, the Guidance Study (9) and the Berkeley Growth Study (1).

[1] I wish to thank Dr. Jean Walker Macfarlane who has placed at my disposal the data from the Guidance Study of the Institute of Child Welfare. These data are here combined with similar material from the 40 cases of the Berkeley Growth Study. These studies have been supported by research grants from the Laura Spelman Rockefeller Fund, the General Education Board, and the Rockefeller Foundation, as well as by the University of California. Clerical work and statistical analyses for this paper have been carried out with assistance of a grant-in-aid from the U.S. Public Health Service.

These 162 children include all cases for whom both Kuder Interest Records and somatic androgyny ratings are available.

The standards of *somatic androgyny* (2) have been developed from the body photographs of the 17- to 18-year-olds in our several growth studies at the Institute of Child Welfare (1, 7, 9). These standards, which are shown in Figure 1, have been derived from ratings of variations in body form of over two hundred normal healthy young people including both sexes in approximately equal number. As may be seen from the standards, the variations in form are of two principal kinds. There is the *degree* of differentiation, ranging from the neutral childhood form (approached by the boy and girl labeled 3A in Figure 1) to the extreme or exaggerated characteristics of either sex (masculine rating 1, and feminine rating 5). There is also variation in the extent to which an individual has physical characteristics of the opposite sex. ("Bisexual" cases are represented in the two standards in Figure 1 marked 3B.) These two variables, of degree and kind of differentiation, seem to be partially independent.

Somatic androgyny scores are based on the independent ratings of three raters, made from rear-view body photographs. From these scores, together with appraisal from inspection of the photographs, the cases in each sex were classified (by conference agreements, where necessary[2]) into five characteristic builds, as shown in Figure 2. The girls were grouped into: 12 Hyperfeminine, 37 Feminine, 17 Hypofeminine, 8 Hypo-bisexual,[3] and 10 Bisexual. The boys were grouped into: 10 Bisexual, 5 Hypo-bisexual, 10 Hypomasculine, 42 Masculine, and 12 Hypermasculine.

These 10 androgyny groups have been compared for several different mental and physical characteristics. Before considering their psychological correlates, let us examine the extent to which somatic androgyny is related to some other physical characteristics which show sex differences.

One example of physical sex differences is size, as measured by height and weight. The distributions of heights for this sample are shown in Figure 3. In an earlier study on a similar sample (2), the numerical androgyny score was found to be entirely uncorrelated with height in either sex, or with weight in boys. It was, however, definitely related (r of .55) to weight in girls. Heights and weights for this sample are given by androgyny groups, in Table I. There appears to be a pattern, in both sexes, of greatest height and least weight for the hypo-developed builds. Although

---

[2] This method has been described in an unpublished study. Reliabilities are closely similar to those found in the original standardization (2).

[3] In the original study somewhat different terms were used. Those boys and girls who show only slight differentiation from the neutral builds of childhood, were there called Asexual and are here called hypofeminine and hypomasculine. Some individuals showed bisexual tendencies but with only very moderate development of either masculine or feminine characteristics. These were originally called "Intermediate," and later "Hypo-bisexual."

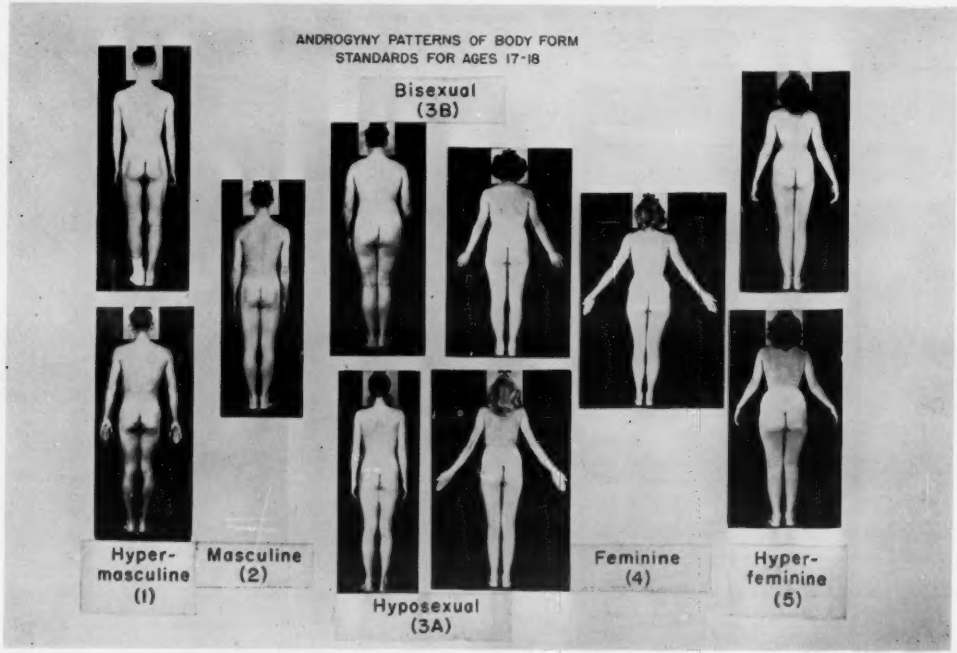


FIGURE 1—The standards used in assessing somatic androgyny. (Reproduced from Bayley and Bayer, *American Journal of Physical Anthropology*, 1946, 4, page 439.)

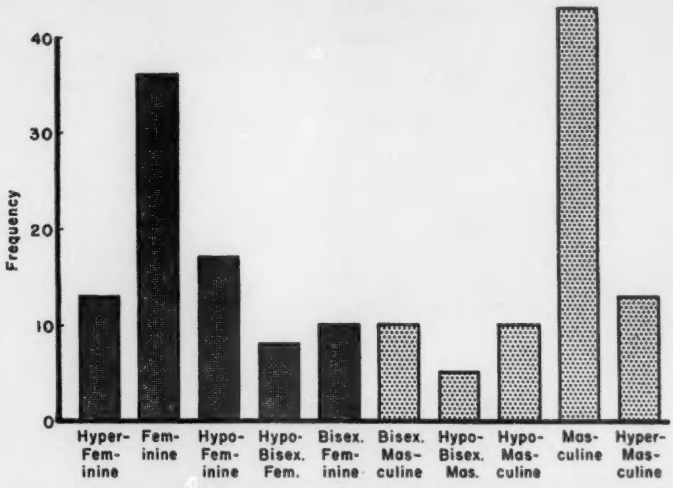


FIGURE 2—Distribution of the cases into somatic androgyny classifications.

none of the group differences in height is significant, that between the Hypermasculine and the Hypomasculine boys approaches significance, at the .027 level of confidence (the hypermasculine being shorter). Several of the groups show significant differences in weight. The Hyperfeminine girls are heavier than the Hypofeminine girls (.014 level); and the Bisexual boys are heavier than all other groups (with Hypomasculine, .002, and

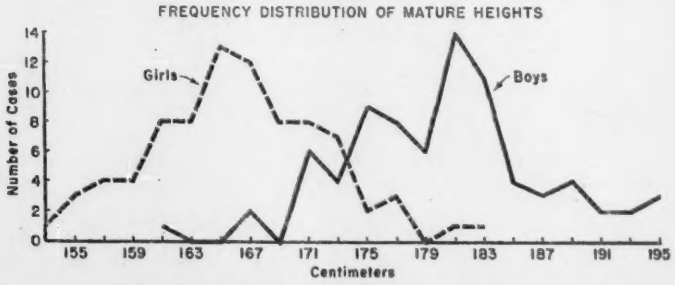


FIGURE 3—Distribution of the cases according to their heights at skeletal maturity.

TABLE I

MEANS AND S.D.'S OF MATURE HEIGHT AND WEIGHT BY ANDROGYNY GROUPINGS

Androgyny Group	*N*	Height (cm) *Mean*	*S.D.*	Weight (kg) *Mean*	*S.D.*
Hypermasculine	10	176.48	7.57	67.73	9.95
Masculine	44	180.01	6.46	69.47	6.57
Hypomasculine	10	183.57	5.92	69.41	5.70
Hypo-bisexual Masculine	5	182.96	7.58	70.24	12.11
Bisexual Masculine	10	179.19	4.66	81.63	10.09
Bisexual Feminine	10	163.12	6.91	60.14	6.43
Hypo-bisexual Feminine	8	165.34	4.49	56.15	7.08
Hypofeminine	17	168.01	7.05	55.70	7.88
Feminine	36	166.26	5.53	58.79	6.34
Hyperfeminine	12	166.17	5.77	61.67	4.66

SIGNIFICANCE OF DIFFERENCES BETWEEN GROUPS

Groups	Height *Critical Ratio*	*Confidence Level*	Weight *Critical Ratio*	*Confidence Level*
Hypermasculine vs. Hypomasculine	2.21	.027	....	....
Hypermasculine vs. Bisexual Masculine	....	....	2.94	.003
Hypomasculine vs. Bisexual Masculine	....	....	3.16	.002
Hyperfeminine vs. Hypofeminine	0.74	.459	2.47	.014
Bisexual Feminine vs. Hypofeminine	1.05	.294	1.53	.133

with Hypermasculine, .003 level of confidence). The important differentiating variable here, in both sexes, appears to be fat, which is primarily a feminine component of build.

In comparing *strength* with androgyny, we have here used a strength *index*[4] which reduces the influence of size on strength, and allows for the

[4] The index used is $\frac{\text{Strength (kg)}}{\text{Weight (kg)} \times \text{Height (cm)}}$, where the strength score is the sum of right grip, left grip, push and pull (each of these being the best of three consecutive trials with the "Collin" type hand dynamometer). See H. E. Jones (6).

TABLE II

MEANS AND S.D.'S OF STRENGTH INDEX* SCORES FOR TEN ANDROGYNY GROUPS, AND FOR BOYS AND GIRLS

Androgyny Group	*N*	*Mean*	*S.D.*
Hypermasculine	11	184.4	18.4
Masculine	43	179.8	20.8
Hypomasculine	10	176.5	21.9
Hypo-bisexual Masculine ..	5	164.6	41.0
Bisexual Masculine	10	143.4	12.8
Bisexual Feminine	10	148.2	23.3
Hypo-bisexual Feminine ..	8	139.0	20.7
Hypofeminine	17	129.2	27.7
Feminine	37	128.6	16.4
Hyperfeminine	11	124.6	13.9
TOTALS			
Boys	79	174.5	25.1
Girls	83	131.5	21.4

* Total strength score (best of three trials for the sum of right grip, left grip, thrust and pull) divided by height in centimeters times weight in kilograms.

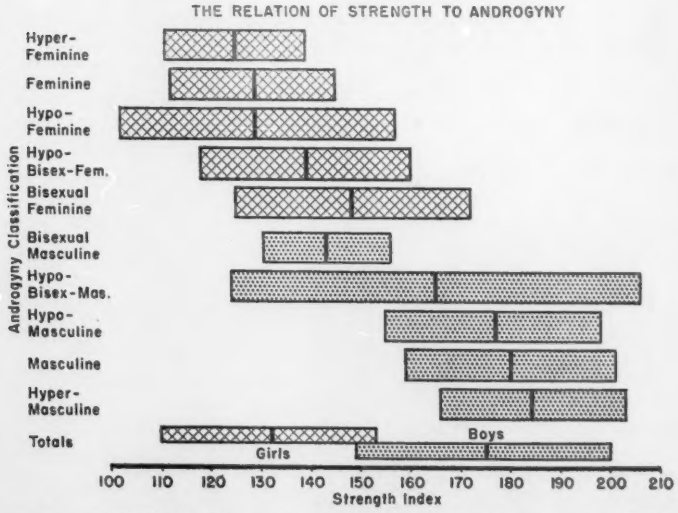


FIGURE 4—Strength Index scores, according to somatic androgyny classifications.

appearance of any relations to differences in physique. The means and S.D.'s of the strength index for the somatic androgyny groups are given in Table II and Figure 4. The Bisexual boys are significantly weaker than the Hypermasculine and the Masculine boys, at the .0001 level of confidence, and also weaker than the Hypomasculine boys, at the .001 level. The Bisexual girls are also stronger than the Feminine girls (.002 level). The

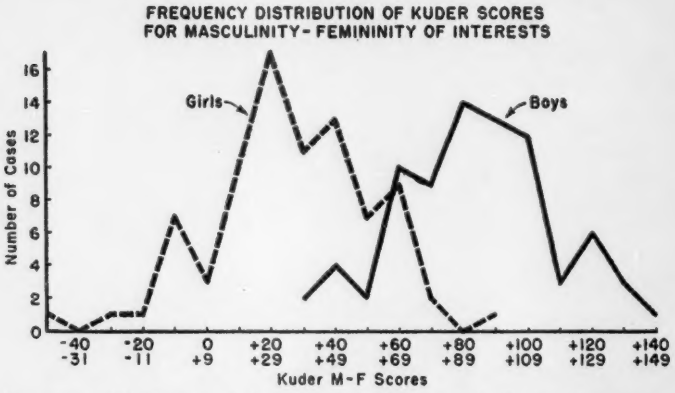


FIGURE 5—Distribution of the cases according to their Kuder Masculinity-Femininity scores at 15.5 or 16.5 years of age.

trends of the means, from strong Hypermasculine to weak Hyperfeminine, are fairly consistent, and the means of the adjacent androgyny groups are closely similar. There appears, then, to be a certain amount of relationship, more pronounced among boys, between androgynic variations in build and physical strength.

These comparisons indicate that some physical sex differences (e.g., strength) exhibit within-sex relationships with somatic androgyny, while others (e.g., height) show only slight correspondences. Whether other kinds of variations in build, such as Sheldon's somatotypes, are related to our androgynic classifications should also be explored. Such a comparison would be very complicated, and has not been attempted here.

Let us now turn our attention to the psychological variables, and their relations to the physical variables. The Kuder Interest Record was given the children between the ages of 15.5 and 16.5 years. From these records we have computed the Masculinity-Femininity interest scores by the formula recently developed by Kuder (8). The distribution of the Kuder M-F scores for these children is shown in Figure 5. The bimodal form is very like the distributions both of the androgyny scores and of the heights of these same children. The intelligence-test scores earned by these boys and

girls show no sex differences, and their distributions are very similar (see Table III).

The Kuder M-F scores are unrelated to height (r's are .10 for boys and .19 for girls); or to absolute strength (r's are .14 for boys and —.03 for girls); or to skeletal age (r's for the B.G.S. sample are —.01 and —.12, for boys and girls, respectively).

TABLE III

MEANS AND S.D.'S OF IQ BY SOMATIC ANDROGYNY GROUP

	18-Year Wechsler-Bellevue			14- or 15-Year Stanford-Binet		
Androgyny Group	*N*	*Mean*	*S.D.*	*N*	*Mean*	*S.D.*
Hypermasculine	11	122.8	12.3	11	131.5	18.4
Masculine	40	119.6	11.3	39	125.7	18.7
Hypomasculine	10	123.8	9.8	9	129.1	11.8
Bisexual and Hypo-bisexual Masculine	13	120.1	9.2	13	121.9	14.2
Bisexual and Hypo-bisexual Feminine	18	115.8	14.5	16	126.3	15.4
Hypofeminine	16	121.6	8.7	16	129.1	9.6
Feminine	32	120.2	11.9	32	125.6	16.5
Hyperfeminine	11	116.7	8.0	11	127.9	13.4
TOTALS						
Boys	74	120.7	11.1	72	126.3	17.4
Girls	77	118.9	11.8	75	126.8	14.7
Total	151	119.8	11.5	147	126.6	16.1

Although the girls' Kuder M-F scores are unrelated to 18-year Wechsler-Bellevue IQ's (the r is .07), the r for boys, of .31, is significant at the one per cent level of confidence. That is, the more intelligent of these boys tend, at 16.5 years, to have the more masculine interests. This low relationship is similar to that reported by Terman and Miles (13) for high school Juniors, although in their study the coefficients were reversed; the girls' IQ's correlated .27 with their M-F scores, while the boys' IQ's and M-F scores correlated only .03.

The means and S.D.'s of the intelligence-test scores at two ages were computed for eight androgyny classifications (the Bisexual and Hypo-bisexual groups were combined). As may be seen from Table III, there is no significant relation between somatic androgyny classification and either the Stanford-Binet at 14-15 years or the Wechsler-Bellevue at 18 years. One is tempted, however, to note a fairly consistent tendency for higher mean

TABLE IV

MEANS AND S.D.'S OF KUDER M-F SCORES FOR SOMATIC ANDROGYNY GROUPS

Androgyny Group	*N*	*Mean*	*S.D.*
Hypermasculine	12	86.83	26.36
Masculine	43	82.12	24.60
Hypomasculine	10	97.10	22.54
Hypo-bisexual Masculine	5	92.00	10.86
Bisexual Masculine	10	98.60	22.34
Bisexual Feminine	10	37.50	31.86
Hypo-bisexual Feminine	8	38.00	28.07
Hypofeminine	17	31.59	17.06
Feminine	36	26.31	24.07
Hyperfeminine	12	33.67	16.70
TOTALS			
Boys	79	88.30	24.25
Girls	83	31.01	24.37

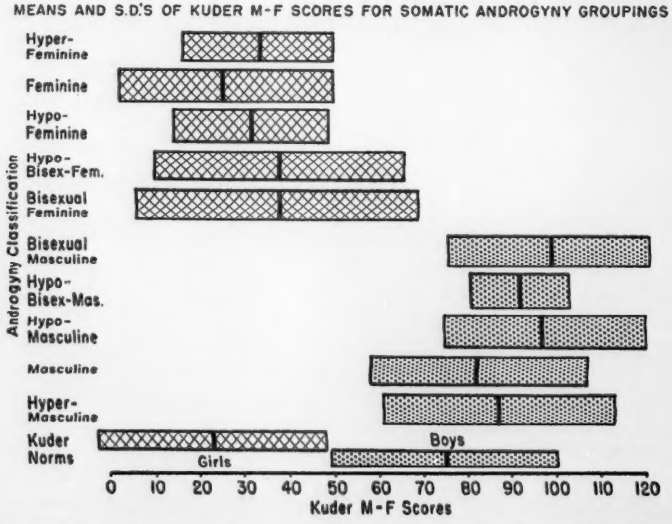


FIGURE 6—Kuder M-F scores according to somatic androgyny classifications.

IQ's among the slender-built ("cerebral type"?) hypo-developed boys and girls.

The relationships between the Kuder M-F and the androgyny groups are shown in Table IV and Figure 6. Within a given sex, the Kuder M-F scores for each androgyny group tend to be distributed throughout the normal range, and there is great overlapping from one group to another. For both sexes, however, the mean Kuder M-F score is lower (more feminine) for the *typical* androgyny group. That is, the somatically Feminine girls have the most "feminine" mean Kuder scores. All others, including the Hyperfeminine, tend to score higher. The somatically Masculine boys, have, on the average, the lowest or least "masculine" of the boys' interest scores. Although there is a wide range of scores in all groups, the mean score for the Asexual, Hypo-bisexual, and Bisexual boys, combined, appears to be significantly higher than the mean for the boys in the Masculine somatic group: the difference is at the two per cent level of confidence. None of the girls' group differences is statistically significant.

It is evident that there is only a slight relation between assessed variations of androgynic body form and the variations, within a sex, of the masculinity or femininity of expressed interests or preferences among these normal adolescents. However, the greatest spread in M-F interest scores

KUDER INTEREST PROFILE OF A BISEXUAL GIRL (16F) WITH VERY FEMININE INTERESTS COMPARED WITH THE KUDER MEAN PROFILES FOR BOYS AND GIRLS

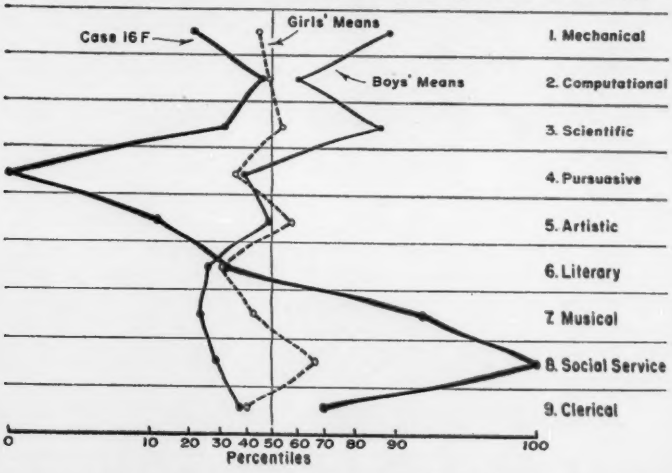


FIGURE 7—The Kuder Interest Profile at 16.5 years of a girl assessed as bisexual on the somatic androgyny scale. For comparison Kuder's means for High School boys and girls are also shown.

occurs in the groups which are physically intermediate, with either Bisexual or undeveloped physiques. This is especially so in the girls. It is possible that the wide variety of interests in these groups reflects different degrees of dominance of the bisexual somatic factors. Such an hypothesis would be difficult to test.

On the other hand, it may be that these physically atypical youths are compensating, emotionally, in a variety of ways to the fact that their body

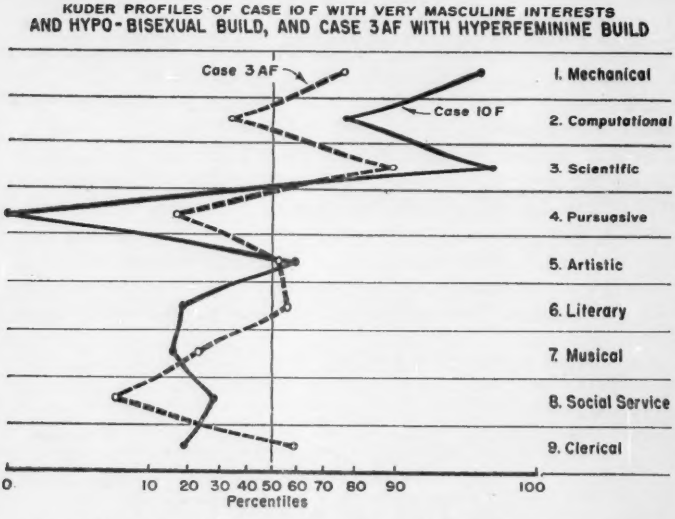


FIGURE 8—Kuder Interest Profiles of two girls with masculine scores on the Kuder M-F scale. Case 10F has a hypo-bisexual build; Case 3AF has a hyperfeminine build.

builds do not conform to the ideals of the culture. Many of the Asexual and Bisexual boys, who, as we have seen, tend also to be physically weak, appear to be making a masculine protest in their interests. If we follow the same line of conjecture, we might say that some of the Bisexual girls accept their builds and develop congruent interests, while others reject them and compensate with feminine interests. It may also be true that the girls with Hyperfeminine builds tend, in our culture, to reject their more Rubens-like figures. Such conjectures could only be tested by more complete analyses of individual cases, taking account, among other things, of the children's attitudes toward their own physiques.

Some individual Kuder preference profiles (high school norms, not weighted for M-F scores) will illustrate the unusual interest patterns of

some of these physical deviates. In Figure 7 is shown a girl who is extremely divergent in both Kuder M-F and Androgyny. The curves of Kuder's means for high school boys and girls are shown, for contrast, with the profiles of Case 16F whose Kuder M-F score of —41 is the most feminine in our study. This girl is strongly Bisexual in build. Her interest profile shows extreme contrasts: she scores at the 100 percentile in Social Service, 95 percentile in Music, and zero percentile in Persuasiveness.

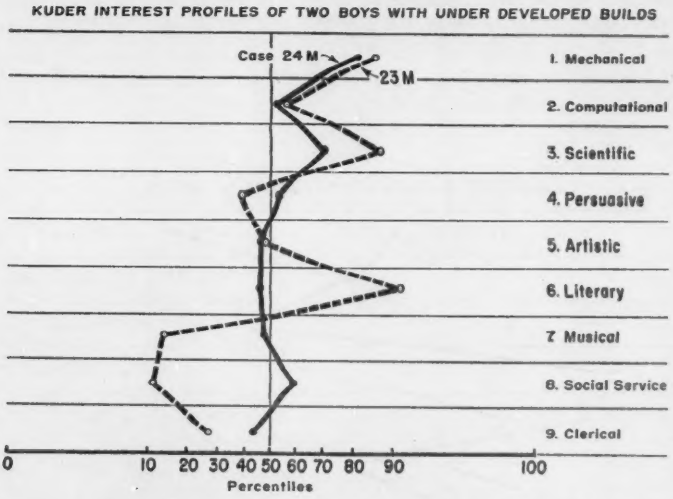


FIGURE 9—Kuder Interest Profiles of two boys with hypomasculine (asexual) builds.

In Figure 8, 10F is a girl with a somewhat masculine or Bisexual build and very masculine interests (her M-F of 94 is above the boys' mean). The other girl, 3AF, though she has a Hyperfeminine build, has interests which fall in the masculine range (M-F score is 55). All three of the girls here presented, especially 16F and 3AF, give evidence in our case material of some emotional difficulties which are associated in part with their deviant physiques. For example, 3AF, with a Hyperfeminine androgyny rating, was called fat by her classmates, and was compared disparagingly with her slender sister. Her difficulty in developing good social adjustments seems to be directly related to these physical comparisons of which she herself was acutely aware.

In Figure 9, we see the profiles of two boys with Hypomasculine androgyny, and with strong indications (from other data) of emotional difficulties. Case 24M, an emotionally disturbed boy, shows both in his Kuder

and other behavior an unusual restriction of interests. His M-F score is 61, which is low for boys. Case 23M, on the other hand, has an M-F of 94, which is near the average for the boys in this group. Although much of his profile is very similar to the mean profile for boys, it shows an unusually high score in Catgory 6 (literary), an interest which does not call for social participation.

But we cannot attribute all of the deviant M-F scores to emotionally maladjusted persons with sex-inappropriate builds. The Kuder profiles of two boys with extremes of high and low M-F scores are shown in Figure 10. They are both socially well-adjusted and successful boys with typically masculine builds. Case 10M has an M-F score of 130; while Case 15M has an M-F score of 59; their Kuder M-F's are three S.D.'s apart.

KUDER PROFILES OF CASE 10M WITH VERY MASCULINE INTERESTS AND CASE 15M WITH VERY FEMININE INTERESTS

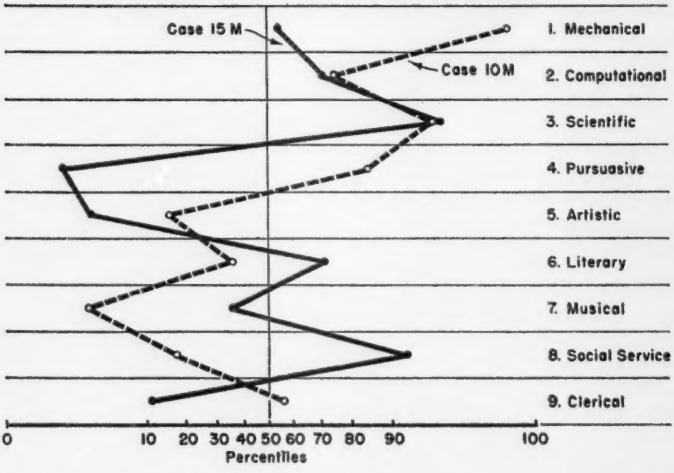


FIGURE 10—Kuder Interest Profiles of two boys with typically masculine builds, one with a very masculine and one with a very feminine (for a boy) Kuder M-F score.

SUMMARY

In a group of normal adolescents the assessed androgynic variables in body form were found to be significantly related to strength, and, in some degree, to weight. There is some (insignificant) tendency for the hypodeveloped individuals in each sex to be taller than their sex average. The

hypomasculine boys are significantly taller than the hypermasculine boys. The general physical picture is one in which muscles and strength (including a heavy skeletal frame) go with greater masculinity; fat and a "delicate" skeletal frame go with greater femininity. Bisexual builds usually have a combination of both muscle and fat, those of either sex having an excess of that factor which is more characteristic of the other sex. The asexual builds, on the other hand, have relatively little of either muscle or fat, along with underdeveloped skeletal proportions.

Intelligence, in this sample, showed no relation to sex variables, either physical or mental, with the possible exception of boys' IQ's with Kuder M-F scores. Even this possible relation is too low to be of any importance, and may very well change with age in these same individuals.

On the Kuder M-F scale, there is some tendency for both boys and girls whose builds are not completely sex-appropriate to have interest scores which deviate in the masculine direction from the average interests of their own sex. This is most marked for the Hypomasculine and Bisexual boys, who tend to have strong masculine interest scores. The girls whose builds have masculine components show an exceptionally wide range of Kuder M-F scores.

A review of the data here presented forces us to the conclusion that, though there are some tenuous indications of relations between the masculine-feminine variables in physique and interests, the outstanding fact in these adolescents, in particular the girls, is that the two series of variables are largely independent of each other. We must assume that somatic androgyny is only one of a multiplicity of factors which may influence the direction of a person's interests. Furthermore, such relationships as do occur are not in the expected direction, along a single masculine-feminine continuum. It is necessary to try to account for the Kuder M-F scores of the cases in the atypical somatic classifications by such factors as the age of the subjects, and their culturally-conditioned emotional attitudes toward their own physiques.

References

1. Bayley, Nancy. The Berekeley growth study. *Child Develpm.*, 1941, 12, 167-173.

2. Bayley, Nancy and Bayer, Leona M. The assessment of somatic androgyny. *Amer. J. phys. Anthrop.*, 1946, 4, 433-461.

3. Draper, G., Dupertuis, C. W., and Caughey, J. L. *Human constitution in clinical medicine.* New York: Paul B. Hoeber, 1944.

4. Gilkinson, H. Masculine temperament and secondary sex characteristics: a study in the relationship between psychological and

physical measurements of masculinity. *Gen. Psychol. Monogr.*, 1937, 19, 105-154.

5. HATHAWAY, S. R. The direction of sex interest in cases of genital dysplasia. *Psychol. Rec.*, 1939, 3, 155-164.

6. JONES, H. E. The adolescent growth study: I. Principles and methods; II. Procedures. *J. consult. Psychol.*, 1939, 3, 157-159; 177-180.

7. JONES, H. E. Motor performance and growth: a developmental study of static dynamometric strength. *Univ. Calif. Publ. Child Develpm.*, 1949, 1 (1).

8. KUDER, G. F. *Revised manual for the Kuder preference record.* Chicago: Science Research Associates, 1946.

9. MACFARLANE, JEAN W. Studies in child guidance: I. Methodology of data collection and organization. *Monogr. Soc. Res. Child Develpm.*, 1938, 3 (6).

10. SELTZER, C. C. The relationship between the masculine component and personality. *Amer. J. phys. Anthrop.*, 1945, 3, 33-47.

11. SHELDON, W. H. and STEVENS, S. S. *The varieties of temperament.* New York: Harper, 1942.

12. SHELDON, W. H., STEVENS, S. S., and TUCKER, W. B. *The varieties of human physique.* New York: Harper, 1940.

13. TERMAN, L. M. and MILES, C. C. *Sex and personality.* New York: McGraw-Hill, 1936.

Manuscript received September 29, 1950.

A LONGITUDINAL STUDY OF SIX RORSCHACH PROTOCOLS OF A THREE-YEAR-OLD CHILD

ROBERT M. ALLEN
Department of Psychology, University of Miami

THE PROBLEM

The year between two and three is interesting both for the child and the observer. Gesell and Ilg (6) describe in great detail the development of the two-year-old into the three-year-old. The description reads like the unfolding of a master plan from infancy to young childhood. The flower begins to unfold at two but meets with some resistance at two-and-a-half. Gesell and Ilg have this to say of the youngster midway between two and three (6, pp. 159-233):

> If a group of nursery school parents should cast a secret ballot to determine the most exasperating age in the preschool period, it is quite likely that the honors would fall to the two-and-a-half-year old because he has a reputation for going to contrary extremes . . . Two-and-a-half-year old is in a transitional period . . . life is charged with double alternatives . . . so he chooses both alternatives not because of downright stubbornness, but because he lacks facility in balancing alternatives and of thinking of one alternative to the exclusion of another.

At three the youngster has "arrived" and in the journey has shed contrariness in favor of a desire to please and even conform within his limited interpretation of the world's demands upon him.

These observations are the result of behavioral analyses of youngsters under varying conditions: solitary play, social situations, and manipulative psychological testing. All describe overt behavior as seen in the growing child. In recent years there has been developed a mode of observing the psychological growth of the child which emphasizes dynamic inferences from the youngster's behavior in his biosocial field—the projective method. This includes such techniques as play analysis, finger painting, the Rorschach Ink Blot Test, children's picture story test, and a host of others along the same somewhat unstructured lines (8). This paper is concerned with the Rorschach Test. The description, scoring, and interpretation need not be given here in view of the rich and varied sources of reference (4). This method has had a wider application with adults but it is being more widely used with children because of its possibilities. The ever-growing body of literature in children's Rorschach is evidence of the applicability of this technique in the child area. The main question that arises in connection with this new application is: To what extent can adult interpretive

standards be applied to children's protocols? It is the writer's hope that this paper will be one of the many approaches to the answer that is being sought so earnestly.

The present writer believes that the six Rorschach protocols obtained from his son, Jeff, show the psychological development from the two-year to the three-year age stages quite clearly and supplement adequately the data obtainable in one-testing observations. Consequently the child was tested on six different occasions:

1. April 24, 1949 — Jeff's second birthday
2. April 26, 1949 — 2 years, 2 days
3. July 24, 1949 — 2 years, 3 months
4. October 24, 1949 — 2 years, 6 months
5. January 24, 1950 — 2 years, 9 months
6. April 24, 1950 — Jeff's third birthday

Thus, a protocol was obtained every three months between the second and third birthdays. The Rorschach was administered by the writer at the same hour on each testing day using the same cards and in the same room of the house.[1]

The Protocols

1. *April 24, 1949: second birthday*

I.	1) *a dog* (anything else?) *No*	1) (where?) *Here* (points to card, no definite location)
II.	1) *orange*	1) (where?) *Here* (points to top red D)
	2) *and the dog, and the orange*	2) (where?) (points to the usual dog D)
III.	1) *a body*	1) (where?) (no response)
IV.	1) *a dog*	1) (where?) *Here* (points repeatedly to the blot, no definite location)
V.	1) *a dog*	1) same as above
VI.	1) *a dog*	1) same as above
VII.	1) *a rabbit*	1) same as above
VIII.	(no response)	

[1] There is some justification for those who might claim that the protocols were influenced by the father-son relationship. This factor does not lend itself any more to measurement than does the psychologist-patient relationship.

IX.	(seems to have lost interest in card, plays with his foot)	
X.	1) *orange*	1) (where?) *No orange*
	2) *blue*	2) (points to popular crab D)

The child's animal world may be seen in six of the nine responses consisting of dogs and a rabbit. The emerging interest in social stimulation may be educed from the two color responses, orange twice, and blue. The concepts are given as one-word responses in all but one instance wherein the child uses a six-word phrase in card II. Attention is not sustained and interest is flagging. He is unable to locate his concepts with any degree of exactitude. The "magic key"[2] method of meeting new situations is characteristic of this protocol. The limited verbal concepts and experiences of the two-year-old stand out.

Rather than engage in flights of fancy, the author believes he can account for the "dogs," "rabbit," and color responses. The dog refers to a neighbor's cocker spaniel who is Jeff's constant companion; the rabbit, an excellent response for plate VII, stems from a traumatic incident in which another neighbor's rabbit mistook the child's finger for part of a piece of lettuce; while the color responses at this early age reflect the color training given by the writer for several months prior to testing. The over-all approach to concept formation as interpreted from the youngster's attempts to locate areas—and only location could be elicited, not determinants—discloses the vagueness of inexperience and verbal foundation so necessary for even concrete thinking. The associations refer to immediate events in the child's life and reveal the nature of infantile interests: animals in his world, and color to which he is becoming sensitive.[3] The subject is shallow, naive, and easily distracted in his play activities. Life is so uncomplicated that a magic world resembling a concrete object (dog) is sufficient solution for the demands of the card-situations five times in nine.

2. *April 26, 1949: 2 years, 2 days*

In the intervening two days, Jeff was taken out into the country where he delightfully observed, and had identified for him, horses and cows. This took place along with a continued experience with a neighbor's 12 cats who roam all over the place and a promise of a kitten with the arrival of an expected litter.

---

[2] Klopfer and Margulies (7) originated this term (magic key) to describe the tendency of the child to repeat a concept (usually an animal) to many of the plates because it represents a magical solution to the problems (ink blots) confronting them—a perseverative response that is used to solve the problem of what the cards represent.

[3] In keeping with Morgan's Law of Parsimony there is no need to postulate esoteric symbolism.

I.	1) *dog*	1) *here* (points to plate vaguely) (eyes?) *no eyes* (ears?) *here* (pointing to usual ear D)
II.	1) *orange*	1) (points to usual top red D)
	2) *dog*	2) *here* (points to usual dog)
III.	1) *no, the other one, no, the other one, pussycat*	1) (no inquiry possible)
IV.	1) *a dog*	1) *here, here* (W card) (nose?) *here* (points to center middle D)
V.	1) *horsey*	1) (W card)
VI.	1) *cow* (child not paying attention to plate, asks E for recording paper)	1) (no inquiry possible)
VII.	1) *a rabbit*	1) *here* (points to entire side D)
VIII.	1) *nothing* (child not paying attention, asks again for E's paper and pencil)	
IX.	(throws card toward E, rejection complete)	
X.	(refuses to accept card, asks again for E's pencil and paper)	

Just two days later and changes are evident. There are eight responses to seven cards, the last three plates are rejected and the child insists on having the examiner's clip-board with the paper thereon and the pencil. The dogs, rabbit, and color are repeated with a substitution of horsey, cow, and pussycat for three of the previous responses.

There is a high degree of consistency (3) between the responses of these two protocols. The youngster is still more interested in the doings of the tester than in the test. Once more the influence of everyday living activities asserts itself and gives some insight into the impression these activities make upon the child. Most important for the understanding of the development of the child is an appreciation of how deeply ingrained become the incidents of life which adults tend to shrug off as trivial.

3. *July 24, 1949: 2 years, 3 months*

During the interval between April and July the youngster actively participated in a new experience: The family adopted the pattern of stopping the car in front of a large memorial fountain on which was automatically

played different colored lights. Jeff named the colors as they appeared in regular succession and was very happy in his successful naming of these colors. This experience is reflected in the following protocol:

I. (takes card in hands, looks at E, turns card over, What do you see?) *Nothing*

II. (returns card to E without a word)

III. (places card on floor. What is this?) *I want cards*

IV. *I want cards*

V. (no response at all)

VI. (slaps card with both hands as if playing with it, bounces it in palm of his hands)

VII. (what do you see there?) (no response at all)

VIII. 1) *a fountain, it's orange and red* 1) *here* (pointing to the side animal D and the bottom D)

IX. *it's a game*

X. (looks at plate closely, obviously examining each part, puts it on top of the other plates without a word)

Before examiner could put the plates away the child reaches out and:

1. picks up plate IX and says: *orange*
2. picks up VIII — no response
3. picks up VII: *bunnies* (E inquires and child points to upper two-thirds) *ear, legs, ear, legs*
4. picks up plate II and says: *red, orange.*

At this age the beginnings of the transitional period is reflected in the Rorschach record. The child's behavior is an admixture of conformity and contrariness: he sees concepts but merely admits to seeing them, steadfastly refusing to name them even under pressure. This record is much

poorer than the first two if considered out of the context of the child's age and the direction of growth. Actually, the impoverished protocol mirrors the developmental process. The refusals of the cards are couched in definite verbalizations: "I want cards," "It's a game," and accompanying gestures. That this rejection behavior is not blindness to the test situation may be seen in the subject's manipulation of the cards in a playful manner. In card *VIII* there is a definite memory picture (engram) associated with the oft-repeated pleasurable experience with the fountain mentioned previously.

The ambivalence between "should" and "should not," the experimentation with "I can and I cannot," becomes evident in the post-test period when the child picked out four of the ten cards spread out in front of him and gave his usual responses. These include appropriate color-naming and the bunny. Superficial, out-of-context, application of the adult interpretive standards would seem to indicate a serious regression in view of the first two protocols. But a consideration of the experiences and the over-all development of the growing child contraindicates such inferences in favor of an expected and normal maturational interpretation.

4. *October 24, 1949: two-and-a-half years*

I.	1) *a skunk*	1) (points to entire card and indicates the head at upper side D)
II.	1) *a skunk* (uses a descriptive term E unable to hear clearly)	
III.	1) *a moo skunk*	1) (inquiry impossible)
IV.	(no response)	
V.	1) *a bunny that stands on the picture*	1) *here* (pointing to center D as head and body, feet at bottom)
VI.	1) *a jingle bell that stands*	1) *rings here* (pointing to top D)

VII to X E unable to hold child's attention and test had to be abandoned.

The two-and-a-half-year-old personality is at its peak. The protocol is extremely constricted with rejection of five cards and only five scorable responses. The word "skunk" seems to be the magic key solution for three of the plates. In this record resistance is not actually directed against the test situation but the youngster prefers motor activity, he has felt his oats and is more confident in his explorations about the house. The "skunk" concept escapes the tester since its origin is unknown. The "bunny" and "jingle bell" are good form for the given areas on plates V and VI respectively. These percepts reflect the growing awareness of reality-testing since the child is able to make a more adequate association between the blot form and the elicited engram. The movement factor enters for the first

time and points to the possible unfolding of inner resources. This seems to indicate the beginning of fantasy injection into his everyday world.

Then two-and-a-half is a real transitional period: the objects in the world about the youngster take on more definite form and may be accounted for more realistically; ambivalence is still there but the change in direction (adient-avoidant) is not sheer stubbornness but growing awareness of self and the surrounding biosocial milieu; the first glimpse of an inner life, a creative fantasy that gives richness to prosaic objects—all of these may be seen in this protocol.

5. January 24, 1950: 2 years, 9 months

I.	1) *I see this* (pointing to the blot) (what is it?) *a skunk here, that skunk*	1) (child encompasses the entire plate in reply to where skunk might be)
II.	(gibberish, plays with card, no response)	
III.	*I see a . . .* (rubs fingers all over the card, gives no further verbalizations)	
IV.	1) *a different skunk, right here*	1) (where?) *Here* (circling finger over entire plate, no details)
V.	(gibberish)	
VI to IX.	(no intelligible response)	
X.	*Mommy*	1) (where is mommy?) *here* (pointing to pink D)

This protocol taken three months later gives the impression of a marked setback in the child's development—only three intelligible responses. The playfulness of the previous test situation is gone. The language is on a higher level as seen in the use of almost complete sentences as well as the tenor of the words themselves. E's entries for plates II, V, VI to IX may be unfair to the child. It is the tester's opinion that the youngster was using words but that the tester was unable to hear them well enough to consider them as acceptable responses. Further, it is the author's belief that the child may have been experimenting with his own verbalizations—a normal developmental stage in learning. The contrariness is on its way to a minimum. The surprising element in the last three protocols is the apparent regression in concept formation. But a close examination reveals that the child has to emphasize one developmental aspect at the expense of others, i.e., verbal usage, reflecting a widening apperceptive mass, is emphasized over the wealth of association and productivity relating to everyday experi-

ences. A more subtle element creeps into the fifth protocol not seen before —the "Mommy" response in X. This response is considered good form for the female concept and may stem from the child's recognition of the female form and its immediate association with his own mother.[4]

6. April 24, 1950: third birthday

I.	1) *a bat*	1) (child points to the individual parts) *wings.* (body?) (child points to center large D)
II.	1) *a bird, a bul*(?)	1) (the entire plate)
III.	1) *a lion*	1) (child points to the usual human D and repeats, *lion*)
	2) *a horse, red*	1) (where?) *up here* (upper side red D)
IV.	1) *a monkey, here's a monkey*	1) (points to plate and circles it entirely)
V.	1) *a cow*	1) (points to the top horn-like D's and says, *cow, horn*)
VI.	1) *a bee, a animal*	1) (points to the top third of the design, says, *wings*)
VII.	1) *a dass* (?), *a lion*	1) (points to the upper two-thirds of side detail)
VIII.	1) *meow—it's a cat*	1) *it's a cat eating* (what is it eating?) *bubble gum.* (usual popular side animal D)
IX.	1) (card held upside down) *Tell me what this is,* (You tell me) *a lion*	1) (card held upside down)—encircles and points to orange detail)
X.	(no response)	

This protocol is much different from the previous five. It appears to be the culmination of the development that has taken place in the one year interval since the first testing. There are ten responses, all animal, one using a good combination of form and color (red horse in plate III), and one popular concept in card VIII—the cat eating bubble gum. Another popular response is given to plate I, bat, in which the child was able to delineate the wings and the body. The content-classification is extremely nar-

[4] It has been suggested in class discussion of these protocols that this "Mommy" response may reveal the child's insecurity at this stage of testing and a recognition of the source of comfort in the stressful situation. The author is inclined to disagree with this interpretation.

row since all responses are "animal" but the variety within the generic term is rich, fairly well formed, and includes two popular responses. The protocol reflects primarily the reduced negativism and a more than faint glimmer of responsiveness to social conformity and an ability to think along accepted lines. The apperceptive mass has expanded tremendously and has assimilated some creativeness which has the potential of becoming the basis for later stability and maturity.[5]

Summary and Conclusions

This longitudinal study by means of six Rorschach protocols administered at spaced intervals discloses the various stages in the psychological maturation of a youngster between the ages of two and three. The data gleaned from these records supplement the type of information obtainable by observation methods. The author suggests that further research be carried on in terms of setting up interpretive standards for children. This should lead to descriptions and inferences of unsophisticated dynamics of childhood life rather than applying adult inferences or concentrating only on the quantitative compilation of location, determinant, and content factors.

Bibliography

1. Allen, R. M. A simple method of validating color and shading shock. *J. consult. Psychol.*, 1948, 12, 360.
2. Allen, R. M. The new concept of personality appraisal. In, *Lectures on evaluation of the enduring qualities of Greek civilization.* Miami, Fla.; Greek Symposium, 1950, Chap. 7.
3. Allen, R. M., Manne, S. H., and Stiff, Margaret. The role of color in Rorschach's Test: the effect of color on the consistency of responses. Unpublished paper, Univ. of Miami, 1950.
4. Bell, J. E. *Projective techniques.* N.Y.: Longmans, Green, 1948.
5. Frank, L. K. *Projective methods.* Springfield, Ill.: Thomas, 1948.
6. Gesell, A. and Ilg, Frances. *Child development.* N.Y.: Harper Bros., 1949.
7. Klopfer, B. and Margulies, H. Rorschach reactions in early childhood. *Rorschach Res. Exch.*, 1941, 5, 1-23.
8. Merry, Frieda and Merry, R. V. *The first two decades of life.* N.Y.: Harper Bros., 1950, rev. ed.

[5] Discounting, of course, a father's pride in his offspring, the potentialities are there.

Manuscript received September 25, 1950.

NEWS NOTES

The *Inventory of Research in Racial and Cultural Relations,* a publication of the Committee on Education, Training and Research in Race Relations of the University of Chicago, is conducting its third annual survey of ongoing research projects in the field of racial and cultural relations. Readers of this publication who are conducting such studies are requested to communicate with the *Inventory of Research in Racial and Cultural Relations* at 4901 South Ellis Avenue, Chicago 15, Illinois, if they have not already received a schedule for reporting their research.

Radcliffe College invites applications for the *Helen Putnam Fellowship for Advanced Research,* open to postdoctoral women scholars in the field of genetics or of mental health broadly defined to include such fields as clinical psychology and child development. The stipend will be $2800 a year, with possibilities of renewal. Application blanks may be obtained from the Secretary of the Graduate School, Radcliffe College, Cambridge, Massachusetts. Completed applications should be returned not later than April 1, 1951.

The William Chandler Bagley Teacher Exchange has been announced by Kappa Delta Pi, National Honor Society in Education. Participants must have had three or more years teaching experience. The exchange must be initiated by Kappa Delta Pi, preferably an active member of the Society. The second party to an exchange may be a non-member. Teachers and school officials interested in an exchange should request information and application forms from Dr. E. I. F. Williams, Recorder-Treasurer, Heidelberg College, Tiffin, Ohio.

The *International Council for Exceptional Children,* announces that its 1951 convention will be held at the Hotel New Yorker, New York City, from April 18 to April 21, 1951.

Contents for March

Body Form in Childhood: Ratios Quantitatively Describing Four Slender-to-Stocky Continua on Boys Four to Eight Years of Age
Howard V. Meredith and *Stanley S. Culp* 3

Sex Differences in the Occurrence of Materials in the Play Constructions of Preadolescents
Marjorie P. Honzik 15

Social Class Differences in Parental Attitudes toward School at Grade I Level
Celia Burns Stendler 37

Some Psychological Correlates of Somatic Androgyny
Nancy Bayley 47

A Longitudinal Study of Six Rorschach Protocols of a Three-Year-Old Child
Robert M. Allen 61

News Notes 71

Information for Contributors and Subscribers

Child Development, one of three publications issued by the Society for Research in Child Development, Inc., is issued quarterly in March, June, September and December. The subscription price is $6.00 per year, postpaid. A limited supply of back issues is available at $1.25 per number. Until the supply is exhausted, available numbers, Volumes 1 to 21 inclusive, may be obtained for $46.00

Other publications of the Society include *Child Development Abstracts and Bibliography* and *Monographs of the Society for Research in Child Development, Inc.*

Child Development Abstracts and Bibliography, published in cooperation with the Children's Bureau of the Federal Security Agency, Washington, D.C., is now in its twenty-fifth volume. This publication is issued February through December —six numbers to a volume. The subscription price is $5.00 per year, postpaid.

Monographs of the Society for Research in Child Development, Inc., issued irregularly during the year, consists primarily of detailed critical reviews and seriatim studies. The subscription price is $4.00 per yearly volume.

The three publications of the Society are available at the special price of $12.00 per year.

Manuscripts and *all business correspondence* relating to the publications should be addressed to Child Development Publications, Fayerweather Hall, East, Northwestern University, Evanston, Illinois.